

**CERTIFICATE OF "EXPRESS MAILING"**

"EXPRESS MAIL" Mailing Label Number: EL 753212757 US

Deposited: January 30, 2007

I hereby certify that this and the enclosed paper(s) and/or fee(s) is/are being deposited with the United States Postal Service as "Express Mail Post Office to Addressee" service under 37 CFR § 1.10 on the date indicated above and is addressed to: Mail Stop PCT, Commissioner for Patents, Office of PCT Legal Administration, P.O. Box 1450, Alexandria, VA 22313-1450.

Patent Application No. : 10/551,661  
Filing Date : September 30, 2005  
Inventor : Lewis Cheng et al  
Atty. Docket No. : 102907-437-NP  
Int'l Appl. No. : PCT/US2004/10027  
Int. Appl. Filing Date : April 01, 2004  
Title : ADVANCED VERSATILE LAYOUT AND RENDERING  
SYSTEM  
I. A. Filing Date : 04/01/2004  
Priority Date : 04/01/2003

Submitted herewith are the following items for filing in the above-captioned application:

1. This Certificate of Express Mailing (No. EL 753212757 US) (2 page);
2. Renewed Petition Under 37 CFR 1.47(a) (5 pages);
3. Exhibit A-1 (4 pages);
4. Exhibit A-2 (3 pages);
5. Exhibit B (9 pages);
6. Exhibit C (4 pages);
7. Exhibit C-1 (71 pages);
8. Exhibit C-2 (3 pages);
9. Exhibit C-3 (3 pages);
10. Exhibit C-4 (3 pages);

11. Exhibit C-5 (3 pages);
12. Exhibit D (7 pages); and
13. Return Receipt Postcard.

TOTAL PAGES IN THIS SUBMISSION: 117 pages + postcard

Robert P. Udal  
Robert P. Udal

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Robert P. Udall  
Robert P. Udall

Patent Application No. : 10/551,661  
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SYSTEM  
I. A. Filing Date : 04/01/2004  
Priority Date : 04/01/2003

**RENEWED PETITION UNDER 37 CFR § 1.47(a) TO FILE ON BEHALF OF NON-SIGNING INVENTOR(S)**

Applicant, Planetii, submit this Renewed Petition Under 37 CFR § 1.47(a) for Filing on Behalf of Non-Signing Inventor(s) in response to the Decision On "Petition Under 37 CFR § 1.47(a) for Filing on Behalf of Non-Signing Inventors" (hereinafter "Petition") mailed on 22 December 2006 from the U.S. Designated/Elected Office (DO/EO/US). See **Exhibit A-1** for a copy of the Decision (hereinafter "First Decision").

## Background

On 30 September 2005, Applicant, PLANETii Inc. (hereinafter “PLANETii”), doing business at 8/F, Enterprise Square 3, 39 Wang Chiu Road, Kowloon Bay, Hong Kong, filed with the United States Patent And Trademark Office (“USPTO”), *inter alia*, basic national fee and a Transmittal Letter to The United States Designated/Elected Office (DO/EO/US) concerning a Filing Under 35 USC 371, naming Lewis Cheng, Joseph Fusion, and Kyung Lee as co-inventors. No an oath or declaration was filed.

On 26 May 2006, the U.S. Designated/Elected Office (DO/EO/US) mailed a Notification of Missing Requirements requesting the (1) oath or declaration and, (2) the surcharge set forth in 37 CFR 1.492(h) for small entity in compliance with 37 CFR 1.27. See **Exhibit A-2** for a copy of the Notification of Missing Requirements.

On 17 August 2006, Applicant, Planetii, filed a Petition Under 37 CFR § 1.47(a) for Filing on Behalf of Non-Signing Inventors (“Petition”), in the above-referenced application in response to the Notification of Missing Requirements Under 371 In the United States Designated/Elected Office.

On 22 December 2006, the United States Designated/Elected Office issued a first Decision on the Petition under 37 CFR 1.47(a), dismissing the Applicant’s Petition for not satisfying the requirement for factual proof that supports Joseph Fusion’s refusal to execute the application papers. The Decision stated that “the showing of record is also consistent with the conclusion that Joseph Fusion simply moved to a new address and changed jobs.”

In response to the Decision (**Exhibit A-1**), Applicant hereby renews its petition to the Commissioner to accept the filing of the above-captioned application by it, as the party to which the invention disclosed and claimed in this application rightfully belongs, and on behalf of and as agent of the non-signing inventor Joseph Fusion. In support of this Renewed Petition and attached hereto as **Exhibit B** are copies of a combined Declaration and Power of Attorney signed by Lewis Cheng, and an addendum executed by Lewis Cheng, Cofounder and Partner of the 37 CFR 1.47(a) Applicant, PLANETii Inc.

Also submitted in support of this Renewed Petition and attached hereto as **Exhibit C** is a Declaration by Patrice A. King, the registered patent attorney that filed the above-captioned application when she was employed at Goodwin Procter LLP, to provide proof of the pertinent facts and to describe the efforts made to obtain Mr. Joseph Fusion's signature.

Also submitted are Patent Assignment papers signed by Kyung Lee and Lewis Cheng, but not Joseph Fusion, and an employment agreement signed by Joseph Fusion. A copy of the executed Patent Assignment and a copy of the executed employment agreement are hereto attached as **Exhibit D**. The signed Patent Assignment and employment agreement support the statement that the 37 CFR 1.47(a) Applicant, PLANETii, is the owner of the invention disclosed in the above-noted application and therefore has sufficient proprietary interest in this application for patent.

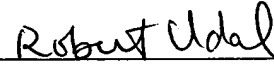
As noted above the Declaration of Patrice A. King provides firsthand statements with exhibits that describe the efforts made to obtain Joseph Fusion's signature. This Declaration provides proof that a FedEx Package, containing copies of the Declaration of Inventorship, the Patent assignment and the above-referenced international application PCT/US2004/10027 in the form of PCT Publication No. WO 2004/090739, and instructions for execution of the application papers, was **successfully Delivered on 19 September 2005**, at 1:18 p.m., to 214 NE 29th Ave, Portland, OR 97232-3204, Mr. Joseph Fusion's last known address.

As of the mailing date of this Renewed Petition neither the Applicant, Planetii, nor the Applicant's legal representative has received executed application papers from Mr. Joseph Fusion. Therefore to preserve the rights of the parties or to prevent irreparable damage it is necessary for the Applicant to file the above-noted application on behalf of the non-signing inventor pursuant to 37 CFR § 1.47(a). It is unlikely that Mr. Joseph Fusion will send executed documents to the Applicant before or after the expiration date for response to the Notification of Missing Requirements.

Should the Office require or consider it advisable that further action by or a personal discussion with the Applicant might be helpful in advancing this case, the Office is invited to telephone the undersigned.

The Commissioner is authorized to charge all required fees, including the petition fee, any additional fees, or credit any overpayment to Deposit Account 06-0923.

Respectfully submitted for Applicant,



---

Robert P. Udal (Reg. No. 56,608)

Richard I. Samuel, Esq. (Reg. No. 24,435)

GOODWIN PROCTER LLP

599 Lexington Avenue

New York, New York 10022

212- 813-8840

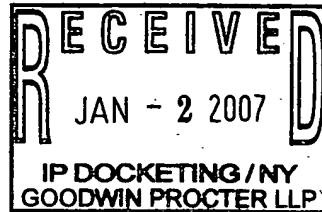
# **Exhibit A-1**





22 DEC 2006

GOODWIN PROCTER LLP  
599 Lexington Avenue  
New York, NY 10022



In re Application of :  
CHENG et al. :  
Application No.: 10/551,661 :  
PCT No.: PCT/US04/10027 :  
Int. Filing: 01 April 2004 :  
Priority Date: 01 April 2003 :  
Attorney Docket No.: 102907-437-NP :  
For: ADVANCED VERSATILE LAYOUT AND :  
RENDERING SYSTEM, METHOD AND :  
PRODUCT :

DECISION ON PETITION  
UNDER 37 CFR 1.47(a)

This decision is in response to applicants' "Petition under 37 CFR 1.47(a) For Filing on Behalf of Non-Signing Inventor(s)" filed 17 August 2006 to accept the application without the signature of joint inventor, Joseph Fusion. The \$200 petition fee has been submitted.

BACKGROUND

On 01 April 2004, applicants filed international application PCT/US04/10027, which claimed a priority date 01 April 2003. Pursuant to 37 CFR 1.495, the period for paying the basic national fee in the United States expired 30 months from the priority date, 01 October 2005.

On 30 September 2005, applicants filed a transmittal for entry into the national stage in the United States, which accompanied by, inter alia: the requisite basic national fee as required by 35 U.S.C. 371(c)(1); a copy of the international application.

On 26 May 2006, the United States Designated/Elected Office mailed a Notification of Missing Requirements under 35 U.S.C. 371 (Form PCT/DO/EO/905) indicating that an oath or declaration in compliance with 37 CFR 1.497(a) and (b) must be filed. The notification set a two-month time limit in which to respond.

On 17 August 2006, applicants filed the present petition under 37 CFR 1.47(a) and a petition for an one-month extension of time.

## DISCUSSION

A petition under 37 CFR 1.47(a) must be accompanied by (1) the fee under 37 CFR 1.17(h), (2) factual proof that the missing joint inventor refuses to execute the application or cannot be reached after diligent effort, (3) a statement of the last known address of the missing inventor, and (4) an oath or declaration by each 37 CFR 1.47(a) applicant on his or her own behalf and behalf of the non-signing joint inventor. Items (1) - (4) have been satisfied.

Regarding item (2) above, Section 409.03(d) of the Manual of Patent Examining Procedure (M.P.E.P.), Proof of Unavailability or Refusal, states, in part:

Where inability to find or reach a nonsigning inventor "after diligent effort" is the reason for filing under 37 CFR 1.47, an affidavit or declaration of facts should be submitted that fully describes the exact facts which are relied on to establish that a diligent effort was made.

The fact that a nonsigning inventor is on vacation or out of town and is therefore temporarily unavailable to sign the declaration is not an acceptable reason for filing under 37 CFR 1.47. Such a petition will be dismissed as inappropriate.

The affidavit or declaration of facts must be signed, where at all possible, by a person having firsthand knowledge of the facts recited therein. Statements based on hearsay will not normally be accepted.

Copies of documentary evidence such as certified mail return receipt, cover letter of instructions, telegrams, etc., that support a finding that the nonsigning inventor could not be found or reached should be made part of the affidavit or declaration. It is important that the affidavit or declaration contain statements of fact as opposed to conclusions.

Where a refusal of the inventor to sign the application papers is alleged, the circumstances of this refusal must be specified in an affidavit or declaration by the person to whom the refusal was made. Statements by a party not present when an oral refusal is made will not be accepted.

Petitioner states that Joseph Fusion has refused to execute the application. A review of the present petition and the accompanying papers reveals that applicants have not satisfied item (2) above, in that, the showing of record is also consistent with the conclusion that Joseph Fusion simply moved to a new address and changed jobs. As such the 37 CFR 1.47 applicant would be obligated to make a diligent effort to locate the non-signing inventor. It is noted that petitioner fails to include evidence to demonstrate that the materials were actually received by the nonsigning inventor at his last known address.

Regarding item (4) above, only Lewis Chen executed the declaration on Joseph Fusion's behalf.

For the above reasons, it would not be appropriate to accept this application without the signature of Joseph Fusion at this time.

### CONCLUSION

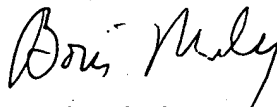
For reasons above, the petition under 37 CFR 1.47(a) is DISMISSED without prejudice.

A proper response must be filed within TWO (2) MONTHS from the mail date of this decision. A proper response is either oath or declaration in compliance with 37 CFR 1.497 executed by Joseph Fusion, or a renewed petition under 37 CFR 1.47(a) overcoming the deficiencies indicated above. Extensions of term under 37 CFR 1.136(a) are available. Failure to timely file the proper response will result in ABANDONMENT. Any reconsideration request should include a cover letter entitled "Renewed Petition Under 37 CFR 1.47(a)." No additional petition fee is required.

Any further correspondence with respect to this matter should be addressed to: Mail Stop PCT, Commissioner for Patents, Office of PCT Legal Administration, P.O. Box 1450, Alexandria, Virginia 22313-1450, with the contents of the letter marked to the attention of the Office of PCT Legal Administration.



Peter Kim  
PCT Legal Administration Detailee  
Tel.: 571-272-6095  
Facsimile: 571-273-0459



Boris Milef  
PCT Legal Examiner  
Office of PCT Legal Administration

## **Exhibit A-2**



## UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
 United States Patent and Trademark Office  
 Address: COMMISSIONER FOR PATENTS  
 P.O. Box 1450  
 Alexandria, Virginia 22313-1450  
 www.uspto.gov

U.S. APPLICATION NUMBER NO.	FIRST NAMED APPLICANT	ATTY. DOCKET NO.
10/551,661	Lewis Cheng	102907-437-NP

Patrice A King  
 GOODWIN PROCTER  
 103 Eisenhower Parkway  
 Roseland, NJ 07068

INTERNATIONAL APPLICATION NO.
PCT/US04/10027

LA. FILING DATE	PRIORITY DATE
04/01/2004	04/01/2003

CONFIRMATION NO. 4597  
 371 FORMALITIES LETTER



\*OC000000018956428\*

Date Mailed: 05/26/2006

### NOTIFICATION OF MISSING REQUIREMENTS UNDER 35 U.S.C. 371 IN THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US)

The following items have been submitted by the applicant or the IB to the United States Patent and Trademark Office as a Designated / Elected Office (37 CFR 1.495).

- Indication of Small Entity Status
- Copy of the International Application filed on 09/30/2005
- Copy of the International Search Report filed on 09/30/2005
- U.S. Basic National Fees filed on 09/30/2005
- Priority Documents filed on 09/30/2005

The applicant needs to satisfy supplemental fees problems indicated below.

The following items **MUST** be furnished within the period set forth below in order to complete the requirements for acceptance under 35 U.S.C. 371:

- Oath or declaration of the inventors, in compliance with 37 CFR 1.497(a) and (b), identifying the application by the International application number and international filing date.
- To avoid abandonment, a surcharge (for late submission of filing fee, search fee, examination fee or oath or declaration) as set forth in 37 CFR 1.492(h) of \$65 for a small entity in compliance with 37 CFR 1.27, must be submitted with the missing items identified in this letter.

#### SUMMARY OF FEES DUE:

Total additional fees required for this application is \$65 for a Small Entity:

- \$65 Surcharge.

**ALL OF THE ITEMS SET FORTH ABOVE MUST BE SUBMITTED WITHIN TWO (2) MONTHS FROM THE DATE OF THIS NOTICE OR BY 32 MONTHS FROM THE PRIORITY DATE FOR THE APPLICATION,**

**WHICHEVER IS LATER. FAILURE TO PROPERLY RESPOND WILL RESULT IN ABANDONMENT.**

The time period set above may be extended by filing a petition and fee for extension of time under the provisions of 37 CFR 1.136(a).

Applicant is reminded that any communications to the United States Patent and Trademark Office must be mailed to the address given in the heading and include the U.S. application no. shown above (37 CFR 1.5)

*A copy of this notice **MUST** be returned with the response.*

SHAKEEL AHMED

Telephone: (703) 308-9140 EXT 208

**PART 1 - ATTORNEY/APPLICANT COPY**

U.S. APPLICATION NUMBER NO.	INTERNATIONAL APPLICATION NO.	ATTY. DOCKET NO.
10/551,661	PCT/US04/10027	102907-437-NP

FORM PCT/DO/EO/905 (371 Formalities Notice)

## **Exhibit B**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**In Re Application of:**

**First Named Inventor:** Lewis Cheng

**Serial No.:** 10/551,661

**Filed:** September 30, 2005

**Title:** Advanced Versatile Layout and Rendering System

**Docket No.:** 102907-437NP

**Examiner:**

**Group Art Unit:**

**DECLARATION AND POWER OF ATTORNEY  
FOR UTILITY AND PLANT PATENT APPLICATION**

This Declaration is

☐ Submitted with Initial Filing.

☒ Submitted after Initial Filing (surcharge under 37 C.F.R. 1.16(e) required).

**As a below named inventor, I hereby declare that:**

My residence, mailing address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention as entitled above, the specification of which

☐ is attached hereto

☒ was filed on 09/30/2005 as United States Application No. 10/551,661 or PCT International Application Number \_\_\_\_\_ and was amended on \_\_\_\_\_ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 C.F.R. 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.



---

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent, inventor's or plant breeder's rights certificate(s), or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached?	
				YES	NO
US 2004/10027	PCT	4/1/2004	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

---

I hereby claim the benefit under 35 U.S.C. Section 119(e) of any United States provisional application(s) listed below:

Application Serial Number(s)	Filing Date
60/459,329	4/4/2003

---

I hereby claim the benefit under 35 U.S.C. Section 120 of any United States application(s), or Section 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. Section 112. I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, C.F.R., Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application

Application Serial Number(s)	Filing Date	Status (pending, patented, abandoned)

---

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

**POWER OF ATTORNEY:** As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

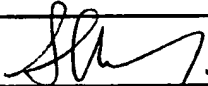
☒ Practitioners at Customer Number **24964** → [ Customer Number Bar Code Label]

☐ Practitioner(s) named below:

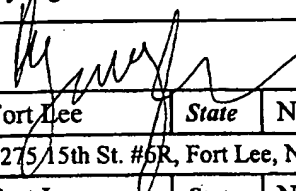
Name	Registration Number

☒ Please direct all future correspondence and telephone calls to:

<i>Attorney Name and Registration No.</i>	Richard I. Samuel, Esq. (Reg. No. 24,435)
<i>Firm Name</i>	Goodwin Procter LLP
<i>Address</i>	599 Lexington Ave
<i>City, State, Zip</i>	New York, NY 10022
<i>Telephone</i>	(212)-459-7021

<b>Name of Inventor</b>		<input type="checkbox"/> A petition has been filed for this unsigned inventor					
<b>Given Name (first and middle)</b>	Lewis			<b>Family Name or Surname</b>	Cheng		
<b>Inventor's Signature</b>					<b>Date</b>	04/28/05	
<b>Residence: City</b>	Mountain View	<b>State</b>	CA	<b>Country</b>	USA	<b>Citizenship</b>	Canada
<b>Mailing Address</b>	2400 W. El Camino Real, #715, Mountain View, CA 94040						
<b>City</b>	Mountain View	<b>State</b>	CA	<b>ZIP</b>	94040	<b>Country</b>	USA

Name of Inventor		<input type="checkbox"/> A petition has been filed for this unsigned inventor					
Given Name (first and middle)	Joseph			Family Name or Surname	Fusion		
Inventor's Signature:					Date		
Residence: City	Portland	State	OR	Country	USA	Citizenship	USA
Mailing Address	214 NE 29th Ave., Portland, OR 97232						
City	Portland	State	OR	ZIP	97232	Country	USA

<b>Name of Inventor</b>		<input type="checkbox"/> A petition has been filed for this unsigned inventor					
<b>Given Name (first and middle)</b>	Kyung			<b>Family Name or Surname</b>	Lee		
<b>Inventor's Signature</b>					<b>Date</b>	4/20/05	
<b>Residence: City</b>	Fort Lee	<b>State</b>	NJ	<b>Country</b>	USA	<b>Citizenship</b>	USA
<b>Mailing Address</b>	1275 15th St. #6R, Fort Lee, NJ 07024						
<b>City</b>	Fort Lee	<b>State</b>	NJ	<b>ZIP</b>	07024	<b>Country</b>	USA

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Application No. : Not yet assigned  
First Named Inventor : Lewis Cheng et al.  
Attorney Docket No. : 102907-437NP  
Int'l Appl. No. : PCT/US2004/10027  
I.A. Filing Date : 04/01/2004  
Priority Date : 04/01/2003

**ADDED PAGE TO COMBINED DECLARATION AND POWER OF ATTORNEY FOR  
SIGNATURE BY PERSON WITH SUFFICIENT PROPRIETARY INTEREST WHERE  
AN INVENTOR IS UNAVAILABLE TO SIGN AND ON BEHALF OF ALL THE  
INVENTORS WHO REFUSE TO SIGN OR CANNOT BE REACHED (37 CFR 1.47(B))**

I, Lewis Cheng, hereby declare as follows:

1. I am a citizen of Canada currently residing at #34B, 3 Seymour Road, Mid Levels,  
Hong Kong.
2. I am Cofounder and Partner of, and authorized by the following juristic entity with  
sufficient proprietary interest in the above-identified application:

Planetii USA, Inc.  
2311 City Place  
Edgewater, NJ 07020

**USA (hereinafter "Planetii")**

3. By virtue of Planetii's proprietary interest, I sign this Declaration on behalf of, and as agent for the following non-signing inventor who either refuses to sign or cannot be found or located. The name and last known address of the non-signing inventor is:

Joseph Fusion  
214 NE 29<sup>th</sup> Avenue  
Portland, OR 97232  
USA

4. Upon information and belief, I aver those facts that the inventor is required to state, 37 CFR 1.64(b).
5. To preserve the rights of the parties and to prevent irreparable damage, it is now necessary for Planetii to make application on behalf of and as agent for the above nonsigning inventor pursuant to 37 C.F.R. § 1.47(b) because the filing date of this application is required to make a claim of priority to International Application Number PCT/US04/10027, filed April 1, 2004, entitled "Advanced Versatile Layout and Rendering System," which claims priority to U.S. Patent Application 60/459,329, filed April 1, 2003.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001 and that such false statements may jeopardize the validity of this document and application to which it relates.

Date: September 27, 2005

  
LEWIS CHENG

## **Exhibit C**



**Certificate of Express Mail**

I hereby certify that this and the enclosed paper(s) and/or fee(s) is/are being deposited with the United States Postal Service as "Express Mail Post Office to Addressee" service under 37 CFR § 1.10 on the date indicated below and is addressed to: Mail Stop PCT, Commissioner for Patents, Office of PCT Legal Administration, P.O. Box 1450, Alexandria, VA 22313-1450.

Robert P. Udal

"EXPRESS MAIL" Label No.

Date

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Patent Application No. : 10/551,661  
Filing Date : September 30, 2005  
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Int. Appl. Filing Date : April 01, 2004  
Title : ADVANCED VERSATILE LAYOUT AND RENDERING  
SYSTEM  
I. A. Filing Date : 04/01/2004  
Priority Date : 04/01/2003

Mail Stop PCT  
Commissioner for Patents  
Office of PCT Legal Administration  
P.O. Box 1450  
Alexandria, VA 22313-1450

**DECLARATION PATRICE A. KING IN SUPPORT OF RENEWED PETITION FOR  
FILING ON BEHALF OF NON-SIGNING INVENTOR(S)**

I, Patrice A. King, declare as follows:

1. I am the registered patent attorney that filed the above-referenced patent application when I was an employee of Goodwin Procter LLP, attorneys of which are the Applicant's legal representative of record in this case.

2. This declaration details factual accounts of my efforts to reach and deliver application papers to the Non-signing Joint Inventor, Mr. Joseph Fusion.

3. On 12 April 2005 I sent electronic copies of Declaration of Inventorship, Patent Assignment and PCT Publication No. WO 2004090739, a published copy of the above-referenced international application No. PCT/US2004/10027, via e-mail to Mr. Joseph Fusion at his e-mail address: [jfusion@monkey.org](mailto:jfusion@monkey.org). Copies of the printout of the sent e-mail and application papers are hereto attached as **Exhibit C-1**.

4. In the e-mail I instructed Mr. Fusion to review the published application, Declaration of Inventorship and the Patent Assignment and to execute the Declaration of Inventorship and the Patent Assignment, and to return a copy of the executed documents to our offices by e-mail, facsimile and/or mail.

5. On 13 April 2005 I sent, via Federal Express, to Mr. Fusion hard copies of the Declaration of Inventorship, Patent Assignment and PCT Publication No. WO 2004090739 along with a letter instructing Mr. Fusion to review the documents and to execute the Declaration of Inventorship and the Patent Assignment and to return the executed documents to our offices by e-mail, facsimile and/or mail. Copies of the FedEx Label I created for the Federal Express mail and the letter I wrote for Mr. Fusion are attached hereto as **Exhibit C-2**.

6. On 17 May 2005 I again e-mailed electronic copies of the Declaration of Inventorship, the Patent Assignment and the PCT Publication No. WO 2004090739, a published copy of the above-referenced international application No. PCT/US2004/10027, to Mr. Joseph Fusion at his e-mail address: [jfusion@monkey.org](mailto:jfusion@monkey.org). A copy of the printout of the sent e-mail is attached hereto as **Exhibit C-3**.

7. For a third time, on 19 September 2005 I again e-mailed electronic copies of the Declaration of Inventorship, the Patent Assignment and the PCT Publication No. WO 2004090739, a published copy of the above-referenced international application No. PCT/US2004/10027, to Mr. Joseph Fusion at his e-mail address: [jfusion@monkey.org](mailto:jfusion@monkey.org). A copy of the printout of the sent e-mail is attached hereto as **Exhibit C-4**.

8. Also, on 15 September 2005 I sent to Mr. Joseph Fusion a second FedEx Package, once again, containing copies of the Declaration of Inventorship, the Patent Assignment and the PCT Publication No. WO 2004090739, along with instructions for him to review the application papers and to execute the Declaration of Inventorship and the Patent Assignment and to return the executed documents to our offices by e-mail, facsimile and/or mail. Attached hereto as **Exhibit C-5** are copies of the FedEx label I prepared for the FedEx Package and Detailed Shipment Tracking Results indicating the package was successfully Delivered on **19 September 2005 at 1:18 p.m.**

9. In each of the five instances I enumerated above I never received executed application papers from Mr. Fusion.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001 and that such false statements may jeopardize the validity of this document and application to which it relates.

Date:

1-10-2007

  
Patrice A. King, Esq.

## **Exhibit C-1**

**King, Patrice A**

---

**From:** King, Patrice A  
**Sent:** Tuesday, April 12, 2005 6:04 PM  
**To:** 'jfusion@monkey.org'  
**Cc:** 'Lewis Cheng'  
**Subject:** Planetii - US Patent Application



WO2004090739A1.4405042\_1.doc (92  
pdf (1 MB)



KB)



Pii Assignment  
Rights-2.doc (2...

RETURN RECEIPT REQUESTED

*Via E-Mail and Federal Express*

US Patent Application for ADVANCED VERSATILE LAYOUT AND RENDERING SYSTEM  
Appl. No.: US04/10027

Dear Joe:

Pursuant to your conversation with Lewis, attached please find for your review and execution a "Declaration of Inventorship" and a "Patent Assignment" for the above identified patent case. Under the United States patent laws, each inventor must sign a statutory oath or declaration of inventorship attesting that they are the first and original inventors of the claimed inventions. The patent assignment will effectuate the transfer of your rights in the invention to Planetii as set forth in your employment letter agreement with Planetii. For your convenience, I have also attached a copy of the published application for your review.

Please return a copy of the executed documents to our offices by e-mail or facsimile, and the original document by mail. If you have any questions, please do not hesitate to contact me.

Kindly acknowledge receipt of this e-mail.

Regards,

Patrice

Patrice Andrea King, Esq.  
Associate Attorney  
Goodwin Procter LLP  
103 Eisenhower Parkway  
Roseland, New Jersey 07068  
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URL: [www.goodwinprocter.com](http://www.goodwinprocter.com)

## ASSIGNMENT OF RIGHTS: PATENT APPLICATION

**WHEREAS, WE, Lewis Cheng**, a citizen of Canada, and **Joseph Fusion and Kyung Lee**, each citizens of the United States, as **ASSIGNORS**, residing respectively at: 2400 W. El Camino Real, #715, Mountain View, CA 94040; 214 NE 29th Ave., Portland, OR 97232; and 1275 15th St. #6R, Fort Lee, NJ 07024; are the inventors of the invention entitled, **Advanced Versatile Layout and Rendering System**, for which an application for a United States Patent was filed on April 1, 2003, Serial no. 60/459329, and for which a PCT application was filed on April 1, 2004, SerialNo. PCT/US04/10027 and;

**WHEREAS, Planetii USA, Inc.**, doing business at 2400 W. El Camino Real #715, Mountain View, CA 94040, **ASSIGNEE** is desirous of obtaining the entire right, title and interest in, to and under the said invention and the said application:

**NOW, THEREFORE**, in consideration of the sum of One Dollar (\$1.00) to us in hand paid, and other good and valuable consideration, the receipt of which is hereby acknowledged, we, the said **ASSIGNORS**, have sold, assigned, transferred and set over, and by these presents do hereby sell, assign, transfer and set over, unto the said **ASSIGNEE**, its successors, legal representatives and assigns, the entire right, title and interest in, to and under the said invention, and the said United States application and all divisions, renewals and continuations thereof, and all Patents of the United States which may be granted thereon and all reissues and extensions thereof; and all applications for industrial property protection, including, without limitation, all applications for patents, utility models, and designs which may hereafter be filed for said invention in any country or countries foreign to the United States, together with the right to file such applications and the right to claim for the same the priority rights derived from said United States application under the Patent Laws of the United States, the International Convention for the Protection of Industrial Property, or any other international agreement or the domestic laws of the country in which any such application is filed, as may be applicable; and all forms of industrial property protection, including, without limitation, patents, utility models, inventors' certificates and designs which may be granted for said invention in any country or countries foreign to the United States and all extensions, renewals and reissues thereof;

**AND WE HEREBY** authorize and request the Commissioner of Patents and Trademarks of the United States, and any Official of any country or countries foreign to the United States, whose duty it is to issue patents or other evidence or forms of industrial property protection on applications as aforesaid, to issue the same to the said **ASSIGNEE**, its successors, legal representatives and assigns, in accordance with the terms of this instrument.

**AND WE HEREBY** covenant and agree that we have full right to convey the entire interest herein assigned, and that we have not executed, or will not execute, any agreement in conflict herewith.

**AND WE HEREBY** further covenant and agree that we will communicate to the said **ASSIGNEE**, its successors, legal representatives and assigns, any facts known to us respecting said invention, and testify in any legal proceeding, sign all lawful papers, execute all divisional, continuing, reissue and foreign applications, make all rightful oaths, and generally do everything possible to aid the said **ASSIGNEE**, its successors, legal representatives and assigns, to obtain and enforce proper protection for said invention in all countries.

**IN TESTIMONY WHEREOF**, We hereunto set our hands and seals the day and year set opposite our respective signatures.

Date: \_\_\_\_\_

\_\_\_\_\_  
Lewis Cheng

Date: \_\_\_\_\_

\_\_\_\_\_  
Joseph Fusion

Date: \_\_\_\_\_

\_\_\_\_\_  
Kyung Lee

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**In Re Application of:**

**First Named Inventor:** Lewis Cheng

**Serial No.:**

**Filed:**

**Title:** Advanced Versatile Layout and Rendering System

**Docket No.:** 102907-437NP

**Examiner:**

**Group Art Unit:**

**DECLARATION AND POWER OF ATTORNEY  
FOR UTILITY AND PLANT PATENT APPLICATION**

This Declaration is

☐ Submitted with Initial Filing.

☒ Submitted after Initial Filing (surcharge under 37 C.F.R. 1.16(e) required).

**As a below named inventor, I hereby declare that:**

My residence, mailing address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention as entitled above, the specification of which

☒ is attached hereto

☐ was filed on \_\_\_\_\_ as United States Application No. \_\_\_\_\_ or PCT International Application Number \_\_\_\_\_ and was amended on \_\_\_\_\_ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 C.F.R. 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

---

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent, inventor's or plant breeder's rights certificate(s), or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached?	
				YES	NO
US 2004/010027	PCT	4/1/2004	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

---

I hereby claim the benefit under 35 U.S.C. Section 119(e) of any United States provisional application(s) listed below:

Application Serial Number(s)	Filing Date
60/459,329	4/4/2003

---

I hereby claim the benefit under 35 U.S.C. Section 120 of any United States application(s), or Section 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. Section 112. I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, C.F.R., Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application

Application Serial Number(s)	Filing Date	Status (pending, patented, abandoned)

---

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.



---

**POWER OF ATTORNEY:** As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

☒ Practitioners at Customer Number **24964** → [ Customer Number Bar Code Label]

☐ Practitioner(s) named below:

Name	Registration Number

☒ Please direct all future correspondence and telephone calls to:

<i>Attorney Name and Registration No.</i>	Richard I. Samuel, Esq.
<i>Firm Name</i>	Goodwin Procter LLP
<i>Address</i>	Lexington Avenue
<i>City, State, Zip</i>	New York, NY 10022
<i>Telephone</i>	(212) 813-8800

---

<b>Name of Sole or First Inventor</b>		<input type="checkbox"/> A petition has been filed for this unsigned inventor					
<i>Given Name (first and middle)</i>	Lewis			<i>Family Name or Surname</i>	Cheng		
<i>Inventor's Signature</i>					<i>Date</i>		
<i>Residence: City</i>		<i>State</i>		<i>Country</i>		<i>Citizenship</i>	
<i>Mailing Address</i>							
<i>City</i>		<i>State</i>		<i>ZIP</i>		<i>Country</i>	

<b>Name of Sole or First Inventor</b>		<input type="checkbox"/> A petition has been filed for this unsigned inventor					
<b>Given Name (first and middle)</b>	Joe			<b>Family Name or Surname</b>	Fusion		
<b>Inventor's Signature</b>					<b>Date</b>		
<b>Residence: City</b>		<b>State</b>		<b>Country</b>		<b>Citizenship</b>	
<b>Mailing Address</b>							
<b>City</b>		<b>State</b>		<b>ZIP</b>		<b>Country</b>	

<b>Name of Sole or First Inventor</b>		<input type="checkbox"/> A petition has been filed for this unsigned inventor					
<b>Given Name (first and middle)</b>	Kyung			<b>Family Name or Surname</b>	Lee		
<b>Inventor's Signature</b>					<b>Date</b>		
<b>Residence: City</b>		<b>State</b>		<b>Country</b>		<b>Citizenship</b>	
<b>Mailing Address</b>							
<b>City</b>		<b>State</b>		<b>ZIP</b>		<b>Country</b>	

(19) World Intellectual Property  
Organization  
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17/30

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LLP, 103 Eisenhower Parkway, Roseland, NJ 07068 (US).

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(81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

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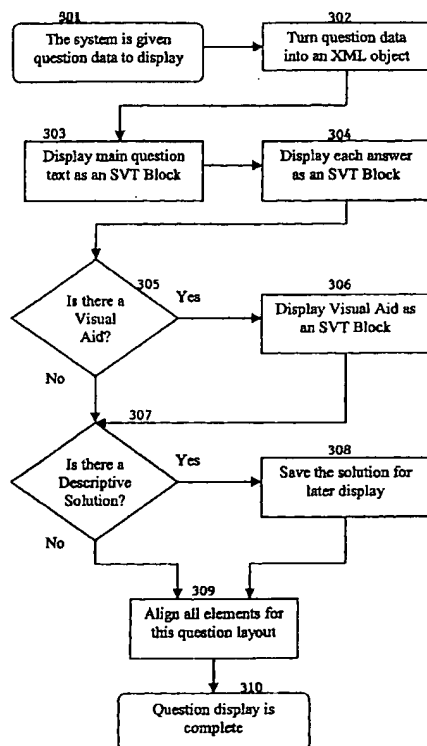
(71) Applicant (*for all designated States except US*): **PLAN-ETII USA INC.** [US/US]; Suite 305, 560 South Winchester Boulevard, San Jose, CA 95128 (US).

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK,

[Continued on next page]

(54) Title: **ADVANCED VERSATILE LAYOUT AND RENDERING SYSTEM, METHOD AND PRODUCT**

Question Display Flowchart



(57) Abstract: Provided herein is a system, method and computer program product for effectively arranging and rendering multimedia information using for example, Macromedia's Flash™ technology, the Extensible Markup Language (XML) language and the Mathematical Markup Language (MathML). The invention utilizes question data (301), possible visual aids (305), possible descriptive solutions (307), and element alignment (309).



TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

**Published:**

- *with international search report*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

## 1 TITLE

2 Advanced Versatile Layout and Rendering System, Method and Product

3.

## 4 CLAIM OF PRIORITY/CROSS REFERENCE OF RELATED

## 5 APPLICATION(S)

6 This application claims the benefit of priority of United States Provisional

7 Application Number 60/459,329, filed April 1, 2003, entitled "Advanced

8 Versatile Layout and Rendering System," hereby incorporated in its entirety

9 herein.

10

## 11 STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR

## 12 DEVELOPMENT

13 Not applicable.

14

## 15 COPYRIGHT/TRADEMARK STATEMENT

16 A portion of the disclosure of this patent document may contain material which is

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18 has no objection to the facsimile reproduction by anyone of the patent document

19 or the patent disclosure, as it appears in the Patent Office patent files or records,

20 but otherwise reserves all copyrights and trademarks.

1 BACKGROUND

2 1. Field of the Invention

3 The present invention relates generally to graphical rendering systems and more  
4 particularly to a system, apparatus, process and article of manufacture for  
5 providing improved interactive, graphical applications using, for example,  
6 Macromedia Flash™ technology available from Macromedia Inc., the Extensible  
7 Markup Language (XML) language and the Mathematical Markup Language  
8 (MathML).

9  
10 Details of Macromedia Flash™ technology, including preferred software and  
11 hardware environments, can be found in various sources such as: Macromedia's  
12 website, <<http://www.macromedia.com>>, conference notes from FlashForward  
13 and Macromedia Ucon; in several books published, for example by Friends of Ed,  
14 O'Reilly & Co. and Macromedia; articles and user forums on websites such as  
15 We're Here, FlashKit, UltraShock, and Figleaf's FlashCoders.

16  
17 Details of XML and MathML, including preferred software and hardware  
18 environments, can also be found in various sources including the W3C's website,  
19 <<http://www.w3c.org>>. Specifically, the current MathML specification entitled,

1 "Mathematical Markup Language (MathML) Version 2.0," is located at  
2 <<http://www.w3.org/TR/2001/REC-MathML2-20010221>>.

3

4 Each of the above references and any additional reference provided herein are  
5 incorporated in its entirety herein.

6

## 7 2. Description of Related Art

8

9 Currently, multimedia information comprising text, graphics, mathematical  
10 expressions, symbols and other indicia (collectively, referred to as "mathematical  
11 expressions"), etc., is developed and presented as follows:

12

13 Current web browsers, e.g., Internet Explorer™, Netscape™, etc., display stylized  
14 text and graphics/images however, only a few lesser known web browsers contain  
15 native MathML support, thereby limiting use.

16

17 Another technique involves manually generating the entire multimedia layout  
18 using a graphical creation and rendering program such as Macromedia Flash  
19 MX™ development tool by Macromedia, Inc. However, manual layout is acutely



1 impractical due to high development costs and the severe constraints placed on  
2 maintainability, scalability and portability.

3

4 The Macromedia Flash Player™ and its associated Flash Plug-in™ display  
5 stylized text that is formatted as a Hypertext Markup Language (HTML) object.  
6 However, such an arrangement offers no integration with graphics or  
7 mathematical expressions.

8

9 Existing software products display mathematical expressions by rendering  
10 MathML objects to a graphical format such as the Joint Photographic Experts  
11 Group (JPEG) format. However, to be effective the graphics must be displayed  
12 inline with text. Further pre-rendering the graphics or rendering them  
13 dynamically to address the preceding requirement is costly in performance,  
14 storage and bandwidth, as well as licensing fees.

15

16 The present invention solves the aforementioned limitations of the prior art.  
17 Specifically, the present invention is a comprehensive solution for effectively  
18 arranging and rendering multimedia information comprising mixed data types  
19 including: text, graphics, animations, video and mathematical expressions. The  
20 mixed data may be displayed in various sizes and formats and is in a portable and

1 maintainable format. In addition, there is support for certain technologies, such  
2 as, Macromedia Flash™, multilingual and Unicode support, and client-server n-  
3 tier implementations. Furthermore, performance and costs are kept at acceptable  
4 levels.

5

6 Additional aspects, features and advantages of the present invention will become  
7 better understood with regard to the following description.

8

#### 9 BRIEF DESCRIPTION OF THE DRAWING(S)

10 Referring briefly to the drawings, embodiments of the present invention will be  
11 described with reference to the accompanying drawings in which:

12

13 Figure 1A illustrates an exemplary system constructed in accordance with the  
14 teachings expressed herein.

15

16 Figure 1B illustrates an exemplary networked system constructed in accordance  
17 with the teachings expressed herein.

18

19 Figure 2 illustrates an exemplary data format in accordance with the teachings  
20 expressed herein.

1

2 Figure 3 illustrates an exemplary process flow in accordance with the teachings  
3 expressed herein.

4

5 Figure 4 illustrates an exemplary psuedo-code listing implementing the  
6 embodiment of FIG. 3 in accordance with the teachings expressed herein.

7

8 Figure 5 illustrates an additional and exemplary process flow in accordance with  
9 the teachings expressed herein.

10

11 Figure 6 illustrates an exemplary psuedo-code listing implementing the  
12 embodiment of FIG. 5 in accordance with the teachings expressed herein.

13

14 Figure 7 illustrates an exemplary user interface in accordance with the teachings  
15 expressed herein.

16

## 17 DETAILED DESCRIPTION OF THE PRESENT INVENTION

18 Referring more specifically to the drawings, for illustrative purposes the present  
19 invention is embodied in the system configuration, method of operation, data  
20 format and application code, generally shown in Figures 1 - 7. Application code

1    may be embodied in any form of computer program product. A computer program  
2    product comprises a medium configured to store or transport computer readable  
3    code, or in which computer readable code may be embedded. Some examples of  
4    computer program products are CD-ROM disks, ROM cards, floppy disks,  
5    magnetic tapes, computer hard drives, servers on a network, and carrier waves.

6

7    It will be appreciated that the system, method of operation, data object and  
8    computer product described herein may vary as to the details without departing  
9    from the basic concepts disclosed herein. Moreover, numerous specific details  
10   are set forth in order to provide a more thorough description of the present  
11   invention. However, all specific details may be replaced with generic ones.  
12   Furthermore, well-known features have not been described in detail so as not to  
13   obfuscate the principles expressed herein. While exemplary embodiments of the  
14   present invention described herein is specifically directed to a Macromedia Flash-  
15   XML-MathML based environment, the invention is not limited thereby as one  
16   skilled in the art can readily adapt the concepts presented herein to a preferred  
17   environment. Therefore, other suitable and equivalent programming languages,  
18   platforms and architectures, etc. fall within the scope of the present invention.

19

1 FIG 1 illustrates an exemplary hardware configuration of a processor-controlled  
2 system on which the present invention is implemented. One skilled in the art will  
3 appreciate that the present invention is not limited by the depicted configuration  
4 as the present invention may be implemented on any past, present and future  
5 configuration, including for example, workstation/desktop/laptop/handheld  
6 configurations, client-server configurations, n-tier configurations, distributed  
7 configurations, other networked configurations, etc., having the necessary  
8 components for carrying out the principles expressed herein.

9  
10 FIGS. 1A & B generally depict an advanced versatile layout and rendering system  
11 700 in accordance with the teachings expressed herein, comprising, but not  
12 limited to, a bus 705 that allows for communication among at least one processor  
13 710, at least one memory 715 and at least one storage device 720. The bus 705 is  
14 also coupled to receive inputs from at least one input device 725, e.g., mouse,  
15 keyboard, pen, pad, etc., and provide outputs to at least one output device 730,  
16 monitor, printer, other display medium, etc.. The at least one processor 710 is  
17 configured to perform the techniques provided herein, and more particularly, to  
18 execute the following exemplary computer program product embodiment of the  
19 present invention. Alternatively, the logical functions of the computer program  
20 product embodiment may be distributed among processors connected through

1 networks or other communication means used to couple processors. The  
2 computer program product also executes under various operating systems, such as  
3 versions of Microsoft Windows™, Apple Macintosh™, UNIX, etc.

4  
5 The present invention may be implemented as a computer program product (also  
6 referred to as “QD module”) that is developed for and implemented in the  
7 Macromedia Flash™ environment as, e.g., a Flash™ client application code  
8 module. The QD module in conjunction with a Super-Versatile-Text Display sub-  
9 module (also referred to as “SVT module”) (described below) effectively present  
10 multimedia information on a display output device.

11  
12 FIG. 2 displays an exemplary data format utilized by the QD module in  
13 accordance with the present invention. That the depicted layout and data are  
14 necessarily defined by the environment in which they are used will be apparent to  
15 those skilled in the art. In one embodiment, the QD data format is implemented  
16 as an XML object, an open web standard that is understood by a Flash™  
17 application. The QD data format preferably uses Unicode as the character  
18 encoding, which allows for a huge character set, including most languages and  
19 math symbols. The QD data format also allows for and intermingles styled text,  
20 such as italics, bold, etc., graphics, and mathematical expressions, symbols and

1 other indicia. The graphics may be defined as standard JPEG files or as Flash  
2 SWF™ files and can be animated or interactive. Mathematical expressions are  
3 defined as MathML, an open standard based on XML, which can be imported and  
4 exported by most math software products.

5

6 FIG. 3 depicts an exemplary process flow of the QD module in accordance with  
7 the present invention.

8

9 As shown, at 301, content data, e.g., question data is entered into the system. The  
10 content data includes text, styled text, specifications of external data files  
11 (containing, e.g., graphics or animations), MathML and other displayable objects.  
12 The content data is used to generate main question content and associated answer,  
13 Visual Aid (optionally), and Descriptive Solution (optionally) content.

14

15 At 302, the system processes the question data and converts said data into an  
16 XML tree object. The question data is used to generate text for a main question.

17

18 At 303, the system displays the question text as a Flash™ data block.

19

1 At 304, the system displays potential answer(s) to the main question as a Flash™  
2 data block;

3

4 At 305, the system checks for a Visual Aid related to the main question. As its  
5 name suggests, a Visual Aid, graphical illustrates related question concepts.

6 Depending on the results, processing continues to 306 or 307. If there is a Visual  
7 Aid, processing continues to 306 and then 307. If there is no Visual Aid,  
8 however, processing continues directly to 307.

9

10 At 306, the system displays the Visual Aid as a Flash™ data block and processing  
11 continues to 307.

12

13 At 307 and the system checks for a Descriptive Solution related to the main  
14 question. Depending on the results, processing continues to 308 or 309. If there is  
15 a Descriptive Solution, processing continues to 308 and then 309. If there is no  
16 Descriptive Solution, however, processing continues directly to 309.

17

18 At 308, the system saves the Descriptive Solution for later display as a Flash™  
19 data block and processing continues to 307.

20



1 At 309, the system aligns all data elements according to a desired layout.

2

3 At 310, the system displays the question accordingly.

4

5 FIG. 7 depicts an exemplary user interface depicting the various elements for  
6 display. As shown, the question text data is presented as Display Area 2, the  
7 potential answer choice(s) data is presented as Display Area 4, the correct answer  
8 data is presented as Display Area 6, the Visual Aid data is presented as Display  
9 Area 8 and the Descriptive Solution data is presented as Display Area 10.

10

11 FIG. 4 depicts exemplary pseudo code for implementing the QD module (also  
12 reproduced below).

13

#### 14 QD Pseudo-code

15

```
16 function parseQuestionXML
17     convert raw text to an XML tree
18     get question layout style from XML
19 end parseQuestionXML function
```

20

21

```
1      function buildQuestionObjects
2          // Sort through branches of question XML.
3          For each branch
4              if the branch is the main question text
5                  create a movieclip to contain the text
6                  call the displaySVTBlock function
7              else if the branch is the answer options
8                  create a movieclip to hold the answers
9                  for each answer
10                     create a movieclip to hold the answer
11                     attach an answer button
12                     create a movieclip to hold the answer text
13                     call the displaySVTBlock function
14             end for
15         else if the branch is some other content block
16             if the type of content is visual aid
17                 if this layout calls for a visual aid
18                     create a movieclip to contain the
19 visual aid
20                     call the displaySVTBlock function
21             else if the type of content is descriptive
22 solution
23                 save the contents for possible later
24 display
25             end if
```

```
1           end if
2       end for
3   end buildQuestionObjects function
4
5   function layoutQuestion
6       // Positions are based on the question layout style.
7       Position the main question text
8       position the answer block
9       position the answers within the answer block
10      position the visual aid, if required
11      position any other content block
12  end layoutQuestion function
```

13

14

15 FIGS. 5 and 6 depict additional features of the QD module in accordance with the  
16 present invention. Specifically, FIG. 5 illustrates an exemplary process flow of  
17 the Super-Versatile-Text Display module or SVT module. The QD module  
18 interacts with (calls) the SVT module to visually render the QD content data.

19

20 As shown, at 501, content data is entered into the system. This content data is  
21 displayed as follows:

22

1 At 502, the system traverses the XML tree to determine if content (node) is left  
2 to display. If yes, processing continues to 503. If no, processing continues to  
3 505.

4

5 At 503, the system determines the kind of content left to display. Depending on  
6 the results, the system follows alternate paths. If the content is text, processing  
7 continues to 504A. If the content is an external file, processing continues to  
8 504B. If the content is MathML, processing continues to 504C.

9

10 At 504A, the system locates a display line that can hold the text data object. The  
11 system then creates a new text object having the appropriate text and style format  
12 and processing returns to 502.

13

14 At 504B, the system locates a display line that can hold the external file data  
15 object. The system then loads the external file onto the line and processing returns  
16 to 502.

17

18 At 504C, the system locates a display line that can hold the MathML data object.  
19 The system then renders the MathML object and processing returns to 502.

20

1 When there is no node-data content left to display, processing continues to 505  
2  
3 At 505, the system formats the lines and all data objects within them and displays  
4 the same at 506.  
5  
6 FIG. 6 depicts exemplary pseudo code for implementing the SVT module (also  
7 reproduced below).

8

9 **SVT Display Pseudo-code**

10

11

```
12 // The displayContentBlock function is the interface to
13 other code.
14 // External code would call this function, specifying the
15 xml data to
16 // display, the destination to display into, and any non-
17 default
18 // configuration options.
19
20 Function displaySVTBlock
21
```

```
1          // Initialize the environment of the destination,
2      based on
3          // configuration options.
4          Set the environment's width
5          set a default text style
6
7      for each node in the XML data
8          if node is text
9              call the displayText function
10         else if node is a visual aid file reference
11             call the loadFile function
12         else if node is MathML
13             call the displayMath function
14         end if
15     end for
16
17     for each line that has been created in destination
18         for each object in line
19             gather measurements
20         end for
21         compute shared baseline and boundaries of line
22         for each object in line
23             position the object so baselines are
24 aligned
25     end for
```

```
1             align line to other lines and destination
2         end for
3
4     end displaySVTBlock
5
6
7
8     function displayText
9
10        inherit the default text style
11        modify the style as specified for this node
12        create an object to hold text within the current line
13
14        while there is text in the node
15            remove a word of text
16            add the word to the current line of destination
17            if current line has exceeded length
18                remove the last line
19                mark the line done
20                create a new current line
21                create an object to hold text within the
22            current line
23            add the word to the current line
24        end if
25    end while
```

```
1
2     end renderText
3
4
5
6     function loadFile
7
8         extract file information from node
9         create an object of the file's given dimensions
10        begin loading the file
11
12        if the object fits in the current line of destination
13            place the object into the line
14        else
15            create a new line
16            if the object doesn't fit into the new empty
17        line
18            scale the object to fit the line
19            end if
20            place the object into the line
21        end if
22
23    end loadFile
24
25
```



```
1
2     function displayMath
3
4         create an object to render the math node into
5         extract MathML data from node
6         call the renderMath function
7
8         if the object fits in the current line of destination
9             place the object into the line
10        else
11            create a new line
12            if the object doesn't fit into the new empty
13        line
14            scale the object to fit the line
15        end if
16        place the object into the line
17    end if
18
19    end displayMath
20
21
22
23    // This function is called recursively - that is, it calls
24    itself.
```

```
1      // MathML objects are frequently composed of other MathML
2      objects,
3      // such as fractions of fractions, so this recursion is
4      necessary.
5      // Nodes in the MathML are of two major types:  composite
6      or terminal.
7      // Composite nodes contain other nodes, while terminal
8      nodes contain
9      // only values, such as a number, variable, or mathematical
10     symbol.
11     // For instance, a fraction node would have two child
12     nodes, the
13     // numerator and denominator.  Each child is rendered
14     separately, then
15     // the first is placed over the other, and a line is drawn
16     between
17     // them.
18
19     Function renderMath
20
21         if the current node is a composite node
22             call the renderMath function on each child node
23             layout the child node based on node type
24         else if the current node is a terminal node
25             if the node contains text
```

```
1             create a text box of the appropriate
2 style
3             else if the node contains an encoded symbol
4                 insert the graphic for that symbol
5             end if
6         end if
7
8     end renderMath
9
```

## 10 EXTERNAL (PUBLIC) FUNCTION DEFINITIONS

11 This section lists the external functions of the Question Display module. While  
12 there is no strict object-oriented public/private status here, these are the only  
13 functions that should be called by outside code. Unless specified, each function  
14 has no return value.

15

### 16 init(initObj)

17 This function should be called once, before calling any of the other functions  
18 below. It initializes the QD environment with various constants, including font  
19 settings and width and height measurements.

### 20 Arguments

21 initObj An object containing any named values to override configuration options

22

1   displayQuestion(question, return\_mc, return\_func)

2   This function displays a question. When display is complete, it calls the specified  
3   return function.

4   Arguments

5   question       The question data, in well-formed XML text.

6   return\_mc     [optional] The context in which return\_func will be called on  
7   completion.

8   return\_func    [optional] The function that will be called within return\_mc.

9

10

11   removeQuestion()

12   This function removes the displayed question.

13   Arguments

14   (none)

15

16   activateAnswers(notify\_mc, notify\_func)

17   This function activates the answer options, making them interactive for the user.

18   When an answer is selected, the specified notification function is called with two  
19   arguments: the letter of the user's selected answer, and the correct answer.

20   Arguments

1    notify\_mc    The context in which notify\_func will be called on completion.

2    notify\_func    The function that will be called within notify\_mc.

3

4    deactivateAnswers()

5    Deactivates all answer options, so that they do not allow user selection.

6    Arguments

7    (none)

8

9    showUserAnswer(userAnswer, showCorrect)

10   This function marks the answer specified in userAnswer, showing whether the

11   selection was correct or incorrect. If showCorrect is set to true and the user's

12   answer was incorrect, the correct answer is also revealed.

13   Arguments

14   userAnswer    The letter of the answer the user has selected.

15   showCorrect   A true/false flag, telling whether to reveal the correct answer.

16

17

18   getCorrectAnswer()

19   Returns the letter of the correct answer for a displayed question.

20   Arguments

1 (none)

2

3 showCorrectAnswer()

4 Reveals to the user the correct answer to a displayed question.

5 Arguments

6 (none)

7

8

9 getAnswerArray()

10 Returns an array of the letters of all the answer options. This is useful for allowing

11 user selection of an answer via the keyboard.

12 Arguments

13 (none)

14

15 isSolution()

16 This function returns true if there is a descriptive solution available for this

17 question, and false otherwise.

18 Arguments

19 (none)

20

1    displaySolution(dest\_mc, destWidth, return\_mc, return\_func)

2    This function renders the descriptive solution for the question, if it exists. The  
3    solution is rendered in the specified movieclip, at the specified width. Once the  
4    render is complete, the return function is called.

5    Arguments

6    dest\_mc        The movieclip to render the descriptive solution into.

7    destWidth     The width in pixels of dest\_mc's display area.

8    return\_mc     [optional] The context in which return\_func will be called on  
9    completion.

10   return\_func    [optional] The function that will be called within return\_mc.

11

12   displayXMLBlock(svt\_xml, dest\_mc, destWidth, return\_mc, return\_func)

13   This function renders an XML object of question data (also called an SVT Block)  
14   into the specified movieclip, at the specified width. Once the render is complete,  
15   the return function is called.

16   Arguments

17   svt\_xml        An XML object containing a valid chunk of SVT data.

18   dest\_mc        The movieclip to render the descriptive solution into.

19   destWidth     The width in pixels of dest\_mc's display area.

1    return\_mc     [optional] The context in which return\_func will be called on  
2    completion.

3    return\_func   [optional] The function that will be called within return\_mc.  
4  
5

6    displayTextBlock(svtText, dest\_mc, destWidth, return\_mc, return\_func)

7    Like displayXMLBlock(), this function renders an SVT Block into the specified  
8    movieclip, at the specified width. However, the SVT Block should be passed as  
9    plain text, rather than as an XML object. Once the render is complete, the return  
10   function is called.

11   Arguments

12   svtTextXML text describing a valid chunk of SVT data.

13   dest\_mc        The movieclip to render the descriptive solution into.

14   destWidth     The width in pixels of dest\_mc's display area.

15   return\_mc     [optional] The context in which return\_func will be called on  
16   completion.

17   return\_func   [optional] The function that will be called within return\_mc.  
18  
19

20   INTERNAL (PRIVATE) FUNCTION DEFINITIONS



1

2 This section lists the internal functions of the QD module. While there is no strict  
3 object-oriented public/private status here, these functions should not be called by  
4 outside code. Any interaction should occur through the External Functions listed  
5 above. Again, unless specified, each function has no return value)

6

7 `parseQuestionXML(rawText)`

8 This function converts the source text for the question into an XML object. It also  
9 checks the XML for the question's layout, which is required before question  
10 rendering can begin. The XML object and layout value are both stored within the  
11 internal question movieclip.

12 Arguments

13 `rawText` A text string containing the well-formed XML for a full question.

14

15 `buildQuestionObjects()`

16 This function sorts through the question XML object, extracting the question text  
17 and answers, as well as any visual aid, descriptive solution, or other content.

18 Movieclips are created for the question text, answers and visual aid, and their

19 SVT blocks are rendered, via the `displaySVT()` function. The descriptive solution,  
20 if present, is saved for later display.

1    Arguments

2    (none)

3

4    displaySVT(svt\_xml, svt\_mc)

5    This function takes an SVT Block and renders it into the specified SVT  
6    environment. The SVT Block is an XML object, and the SVT environment is a  
7    movieclip containing the settings and configuration information for SVT display.

8    Arguments

9    svt\_xml       An XML object containing an SVT Block.

10   svt\_mc        The SVT environment movieclip to render the SVT Block into.

11

12

13   getDisplayLine(svt\_mc)

14   This function returns a reference to the current line (a movieclip) in an SVT  
15   environment movieclip. The current line will have at least some room for  
16   additional content (text, graphics, rendered MathML). If the last existing line is  
17   full, or there is no current line, this function will create a new one.

18   Arguments

19   svt\_mc        An SVT environment movieclip.

20

1   endDisplayLine(svt\_mc)

2   This function marks the current display line in the SVT Environment as complete,  
3   so that the next call to getDisplayLine() will return a new line. This is useful for  
4   line breaks, or when a content object must wrap to the next line.

5   Arguments

6   svt\_mc        An SVT environment movieclip.

7

8

9   displayVisualAid(va\_xml, svt\_mc)

10   This function renders a visual aid item into an SVT Environment. The visual aid,  
11   usually a SWF or JPEG, will be loaded from a separate file. The height and width  
12   of the object are specified in the XML, so layout can occur without waiting for the  
13   load to complete. (Loading is accomplished using the piiLoader module.)

14   Arguments

15   va\_xml        An XML node from an SVT Block, containing a visual aid.

16   svt\_mc        An SVT environment movieclip.

17

18   processVisualAid(returnID, va\_mc)

1 This function is called from the piiLoader module when a visual aid object has  
2 completed loading. It completes the processing of the loaded file, verifying that it  
3 fits within the dimensions specified in the XML node of the SVT Block.

4 Arguments

5 returnID A piiLoader Load ID, uniquely identifying this load.

6 va\_mc A movieclip containing the loaded file.

7

8 displayMathML(math\_xml, svt\_mc)

9 This function renders a MathML portion of an SVT Block into a single object.

10 The rendering of individual MathML elements is handled by the renderMathML()  
11 function. This function handles the allocation of lines within the SVT

12 Environment, wrapping to the next line if the MathML object is too wide.

13 Arguments

14 math\_xml An XML node from an SVT Block, containing MathML data.

15 svt\_mc An SVT environment movieclip.

16

17 renderMathML(math\_xml, box\_mc, ref\_tf)

18 This function renders individual MathML elements into movieclips containing  
19 text and library symbols. The rendering is handled recursively, so that it calls  
20 itself to render any MathML elements nested within the main element. (For

1 instance, a the fraction MathML element contains two other elements,  
2 representing numerator and denominator.) This function takes as arguments a  
3 node of MathML data, a movieclip to render that data into, and a text format. The  
4 function returns a reference to the movieclip it creates.

5 Arguments

6 `math_xml` An XML node containing MathML data.  
7 `box_mc` A movieclip to create the new movieclip inside of.  
8 `ref_tf` A text format object, to be used in rendering this object's text.

9

10 `displayTextItem(rawText, svt_mc)`

11 This function handles the display of plain and styled text objects from SVT  
12 Blocks. It takes a text string and renders it inside the SVT Environment in the  
13 current text format, splitting the text and wrapping to multiple lines as necessary.

14 Arguments

15 `rawText` A text string.  
16 `svt_mc` An SVT environment movieclip.

17

18 `drawBorder(a_mc, color, bwidth, bheight)`

19 This function draws a border within a movieclip, using the Flash line-drawing  
20 tools. If `bwidth` and `bheight` are not specified, the measured width and height of

1 the movieclip will be used instead. This function is used extensively within the  
2 rendering functions to force certain measurements onto a movieclip. For instance,  
3 a loaded SWF file might not take up the full space it is meant to occupy,  
4 confusing layout. An invisible border greatly eases such layout computations.  
5 (Note that the line-drawing functions are prone to overwrite any existing lines  
6 within the movieclip.)

7 Arguments

8 a\_mc           The movieclip to draw the border into.  
9 color           The color to draw the border with. (Only visible while debugging.)  
10 bwidth [optional] The width to draw the border.  
11 bheight[optional] The height to draw the border.

12

13 layoutQuestion()

14 This function completes the layout of the previously-built question objects. The  
15 question text, answers and visual aid are positioned according to their sizes and  
16 the layout style specified in the question XML.

17 Arguments

18 (none)

19

1 Having now described one or more exemplary embodiments of the invention, it  
2 should be apparent to those skilled in the art that the foregoing is illustrative only  
3 and not limiting, having been presented by way of example only. All the features  
4 disclosed in this specification (including any accompanying claims, abstract, and  
5 drawings) may be replaced by alternative features serving the same purpose, and  
6 equivalents or similar purpose, unless expressly stated otherwise. Therefore,  
7 numerous other embodiments of the modifications thereof are contemplated as  
8 falling within the scope of the present invention as defined by the appended  
9 claims and equivalents thereto.

10

11 Moreover, the techniques presented herein may be implemented in hardware or  
12 software, or a combination of the two. In one embodiment, the techniques are  
13 implemented in computer programs executing on programmable computers that  
14 each include a processor, a storage medium readable by the processor (including  
15 volatile and non-volatile memory and/or storage elements), at least one input  
16 device and one or more output devices. Program code is applied to data entered  
17 using the input device to perform the functions described and to generate output  
18 information. The output information is applied to one or more output devices.

19

1 Each program is preferably implemented in a high level procedural or object  
2 oriented programming language to communicate with a computer system,  
3 however, the programs can be implemented in assembly or machine language, if  
4 desired. In any case, the language may be a compiled or interpreted language. In  
5 one embodiment, the present invention is implemented in the ActionScript  
6 programming language for use in the Macromedia Flash™ environment. The  
7 program code uses Macromedia Flash MX™ to publish, Macromedia Flash  
8 Player™ (e.g., Version 6, Release 48 ,or better) to execute and utilizes the  
9 Macromedia piliLoader and timeQueue code modules.

10

11

12 Each such computer program is preferably stored on a storage medium or device  
13 (e.g., CD-ROM, NVRAM, ROM, hard disk, magnetic diskette or carrier wave)  
14 that is readable by a general or special purpose programmable computer for  
15 configuring and operating the computer when the storage medium or device is  
16 read by the computer to perform the procedures described in this document. The  
17 system may also be considered to be implemented as a computer-readable storage  
18 medium, configured with a computer program, where the storage medium so  
19 configured causes a computer to operate in a specific and predefined manner.

20



1 The description of the exemplary embodiment herein assumes knowledge of  
2 Macromedia Flash™ and ActionScript™ programming language and a general  
3 understanding of programming documentation conventions. Understanding of  
4 layout and design issues, such as page layout for the web or for print, and  
5 especially as regards the layout of mathematical expressions, will also be useful.

6  
7 Additional aspects and/or features of the present invention include: the code  
8 attempts to provide general solutions as much as possible, but may be specific to  
9 the font and layout size of current implementation. If the font or another part of  
10 the display environment is changed radically, spacing within and between lines  
11 may be tweaked, accordingly.

12  
13 Preferably, math symbols, whether by named entity or Unicode characters, are  
14 usable as follows: both named entities and coded characters are expected to exist  
15 alone within the XML terminal tags. That is, in one embodiment of the present  
16 invention, `<mn>5</mn><mn> $\pi$ </mn>` is valid while `<mn>5 $\pi$ </mn>` is not.

17

18

1 Finally, an embodiment of the present invention having potential commercial  
2 success is integrated in the Planetii™ Math System™, an online math education  
3 software product, available at <<http://www.planetii.com/home/>>.

4

1 CLAIMS

2

3 What is claimed is:

4

5 1. A display system for multimedia content data comprising  
6 Mathematical Markup Language (MathML) data, said system  
7 comprising:

8

9 a display medium having a plurality of display lines for rendering  
10 multimedia content data thereon;

11

12 a processor associated with said display medium and configured to:

13

14 receive said multimedia content data comprising textual, MathML, and  
15 external file indicia data;

16

17 parse said received multimedia content data to derive said textual,  
18 MathML and external file indicia data;

19

1           categorize said textual, MathML and file data according to a data  
2           type; wherein said textual data is defined as a TEXT data type, said  
3           MathML data is defined as a MATHML data type and said external  
4           file indicia data is defined as a FILE data type;  
5  
6           store said derived and categorized textual, MathML and external file  
7           indicia data as a tree having a root node and a plurality of offspring  
8           nodes that define left and right subtrees, said root node and said  
9           offspring nodes each having one of said derived textual, MathML and  
10          external file indicia data and respective data type association;  
11  
12          define a traverse procedure that includes:  
13  
14                  visiting a node of said tree,  
15  
16                  determining the data type of said node;  
17  
18                  displaying said node data in accordance with said data type,  
19          wherein:  
20

1           if the data type is TEXT: create a text object having said  
2           textual node data and locate a display line to display said text  
3           object in accordance with predetermined formatting  
4           conventions,  
5  
6           if the data type is FILE: create a file object having said external  
7           file indicia node data and locate a display line to load and  
8           display said file object in-line with previously rendered text  
9           and in accordance with predetermined formatting conventions,  
10  
11          if the data type is MATHML, create a MathML data object  
12          having said stored MathML node data and locate a display line  
13          to display said MathML data object in-line with previously  
14          rendered text and in accordance with predetermined formatting  
15          conventions,  
16  
17          applying said traverse procedure upon the left subtree of said  
18          visited node;  
19

1                   applying said traverse procedure upon the right subtree of said  
2                   visited node; and

3

4                   applying said traverse procedure upon said root node such that  
5                   said root node is the first visited node.

6

7           2. A system as in claim 1 wherein said processor further categorizes said  
8           MathML data as MATHML COMPOSITE and MATHML  
9           TERMINAL data types;

10

11           stores said categorized MathML data as a MathML tree having a root  
12           node and a plurality of offspring nodes that define left and right  
13           subtrees of said MathML tree, said root node and said offspring nodes  
14           of said MathML tree each having one of said derived MathML data  
15           and respective data type association;

16

17           defines a second traverse procedure that includes:

18

19                   visiting a node of said MathML tree,

20

1                   determining the MathML data type of said MathML tree node,  
2  
3                   displaying said MathML tree node data in accordance with said  
4                   data type, wherein:

5  
6                   if the data type is MATHML COMPOSITE: create a  
7                   MathML data object having said stored MathML  
8                   composite node data and locate a display line to  
9                   display said MathML data object in-line with  
10                  previously rendered text and in accordance with  
11                  predetermined formatting conventions, and,

12  
13                  if the data type is MATHML TERMINAL: create a  
14                  MathML data object having said stored MathML node  
15                  terminal node data and locate a display line to display  
16                  said MathML data object in-line with previously  
17                  rendered text and in accordance with predetermined  
18                  formatting conventions,

19

- 1                   applying said second traverse procedure upon the left sub-  
2                   MathML tree of said visited MathML tree node;  
3  
4                   applying said second traverse procedure upon the right sub-  
5                   MathML tree of said visited MathML tree node; and  
6  
7                   applying said second traverse procedure upon said root node of  
8                   said MathML tree such that said root node is the first visited  
9                   node of the MathML tree.  
10  
11           3. The system as in claim 1 or 2 wherein said multimedia content data  
12           comprises Markup Language data.  
13  
14           4. The system as in claim 3 wherein said Markup Language data  
15           comprises Extensible Markup Language (XML) data.  
16  
17           5. The system as in claim 1 or 2 wherein said external file indicia data  
18           comprises information associated with data files comprising graphics,  
19           video, animation, other displayable assets or a combination thereof.  
20



- 1           6. The system as in claim 4 wherein said data files are Macromedia or  
2           Flash-compatible files.  
3
- 4           7. A method of displaying multimedia content data comprising  
5           Mathematical Markup Language (MathML) data, said method  
6           comprising:  
7
- 8           providing a display medium having a plurality of display lines for  
9           rendering multimedia content data thereon;  
10
- 11          receiving said multimedia content data comprising textual, MathML,  
12          and external file indicia data;  
13
- 14          parsing said received multimedia content data to derive said textual,  
15          MathML and external file indicia data;  
16
- 17          categorizing said textual, MathML and file data according to a data  
18          type; wherein said textual data is defined as a TEXT data type, said  
19          MathML data is defined as a MATHML data type and said external  
20          file indicia data is defined as a FILE data type;

1

2

storing said derived and categorized textual, MathML and external

3

file indicia data as a tree having a root node and a plurality of offspring

4

nodes that define left and right subtrees, said root node and said

5

offspring nodes each having one of said derived textual, MathML and

6

external file indicia data and respective data type association;

7

8

defining a traverse procedure that includes:

9

10

visiting a node of said tree,

11

12

determining the data type of said node;

13

14

displaying said node data in accordance with said data type,

15

wherein:

16

17

if the data type is TEXT: create a text object having said

18

textual node data and locate a display line to display said text

19

object in accordance with predetermined formatting

20

conventions,

1

2

if the data type is FILE: create a file object having said external

3

file node data and locate a display line to load and display said

4

file object in-line with previously rendered text and in

5

accordance with predetermined formatting conventions,

6

7

if the data type is MATHML, create a MathML data object

8

having said stored MathML node data and locate a display line

9

to display said MathML data object in-line with previously

10

rendered text and in accordance with predetermined formatting

11

conventions,

12

13

applying said traverse procedure upon the left subtree of said

14

visited node;

15

16

applying said traverse procedure upon the right subtree of said

17

visited node; and

18

19

applying said traverse procedure upon said root node such that

20

said root node is the first visited node.

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8. The method as in claim 7 wherein said method further comprises categorizing said MathML data as MATHML COMPOSITE and MATHML TERMINAL data types;
- storing said categorized MathML data as a MathML tree having a root node and a plurality of offspring nodes that define left and right subtrees of said MathML tree, said root node and said offspring nodes of said MathML tree each having one of said derived MathML data and respective data type association;
- defining a second traverse procedure that includes:
- visiting a node of said MathML tree,
- determining the MathML data type of said MathML tree node,
- displaying said MathML tree node data in accordance with said data type, wherein:

1                   if the data type is MATHML COMPOSITE: create a  
2                   MathML data object having said stored MathML  
3                   composite node data and locate a display line to  
4                   display said MathML data object in-line with  
5                   previously rendered text and in accordance with  
6                   predetermined formatting conventions, and,  
7  
8                   if the data type is MATHML TERMINAL: create a  
9                   MathML data object having said stored MathML node  
10                  terminal node data and locate a display line to display  
11                  said MathML data object in-line with previously  
12                  rendered text and in accordance with predetermined  
13                  formatting conventions,  
14  
15                  applying said second traverse procedure upon the left sub-  
16                  MathML tree of said visited MathML tree node;  
17  
18                  applying said second traverse procedure upon the right sub-  
19                  MathML tree of said visited MathML tree node; and  
20

1                   applying said second traverse procedure upon said root node of  
2                   said MathML tree such that said root node is the first visited  
3                   node of the MathML tree.

4

5           9. The method as in claim 7 or 8 wherein said multimedia content data  
6           comprises Markup Language data.

7

8           10. The method as in claim 9 wherein said Markup Language data  
9           comprises Extensible Markup Language (XML) data.

10

11          11. The method as in claim 7 or 8 wherein said external file indicia data  
12          comprises information associated with data files comprising graphics,  
13          video, animation, other displayable objects or a combination thereof.

14

15          12. The method as in claim 11 wherein said data files are Macromedia  
16          Flash or Flash-compatible files.

17

18

19

20

1           13. A user interface for presenting question and answer multimedia data  
2           comprising mathematical MathML content, said system comprising:  
3  
4           a processor configured to:  
5  
6           receive said multimedia data comprising textual, MathML and external  
7           file data;  
8  
9           parse said received multimedia data to derive said textual, MathML  
10          and external file data;  
11  
12          generate question content and associated answer, visual aid and  
13          descriptive solution content based on said derived textual, MathML  
14          and external file data;  
15  
16          display first, second, third and fourth display containers on said  
17          display device, said first display container including a presentation  
18          area for displaying said question content; said second display container  
19          including a presentation area for displaying said answer content; said  
20          third display container including a presentation area for displaying said

1 visual aid content; said fourth display container including a  
2 presentation area for displaying said descriptive solution content; and  
3  
4 wherein for each of said first, second, third and fourth display  
5 containers said MathML and external file data of said container  
6 content are displayed in-line with said textual data of said container  
7 content.

8

9 14. The user interface as in claim 13 wherein said external file data  
10 includes graphics, video, animation, other displayable objects or any  
11 combination thereof.

12

13 15. The user interface as in claim 13 or 14 wherein said multimedia data  
14 comprises Markup Language data.

15

16 16. The user interface as in claim 15 wherein said Markup Language data  
17 comprises Extensible Markup Language (XML) data.

18



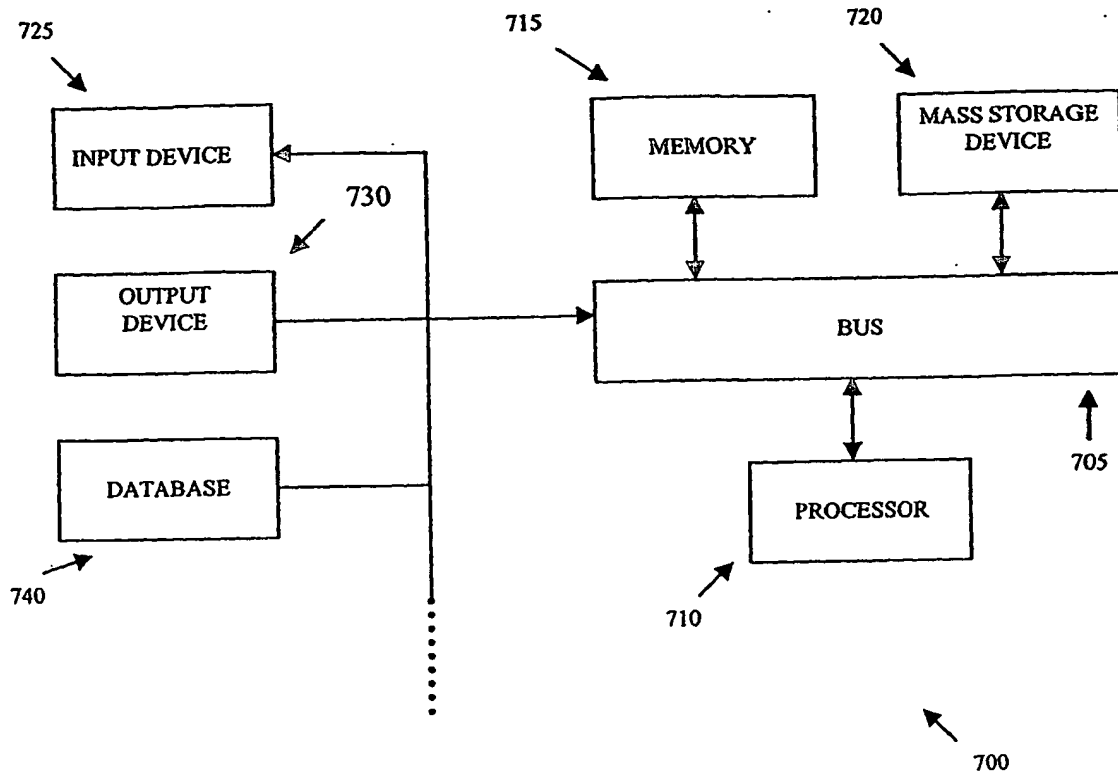


Fig. 1A

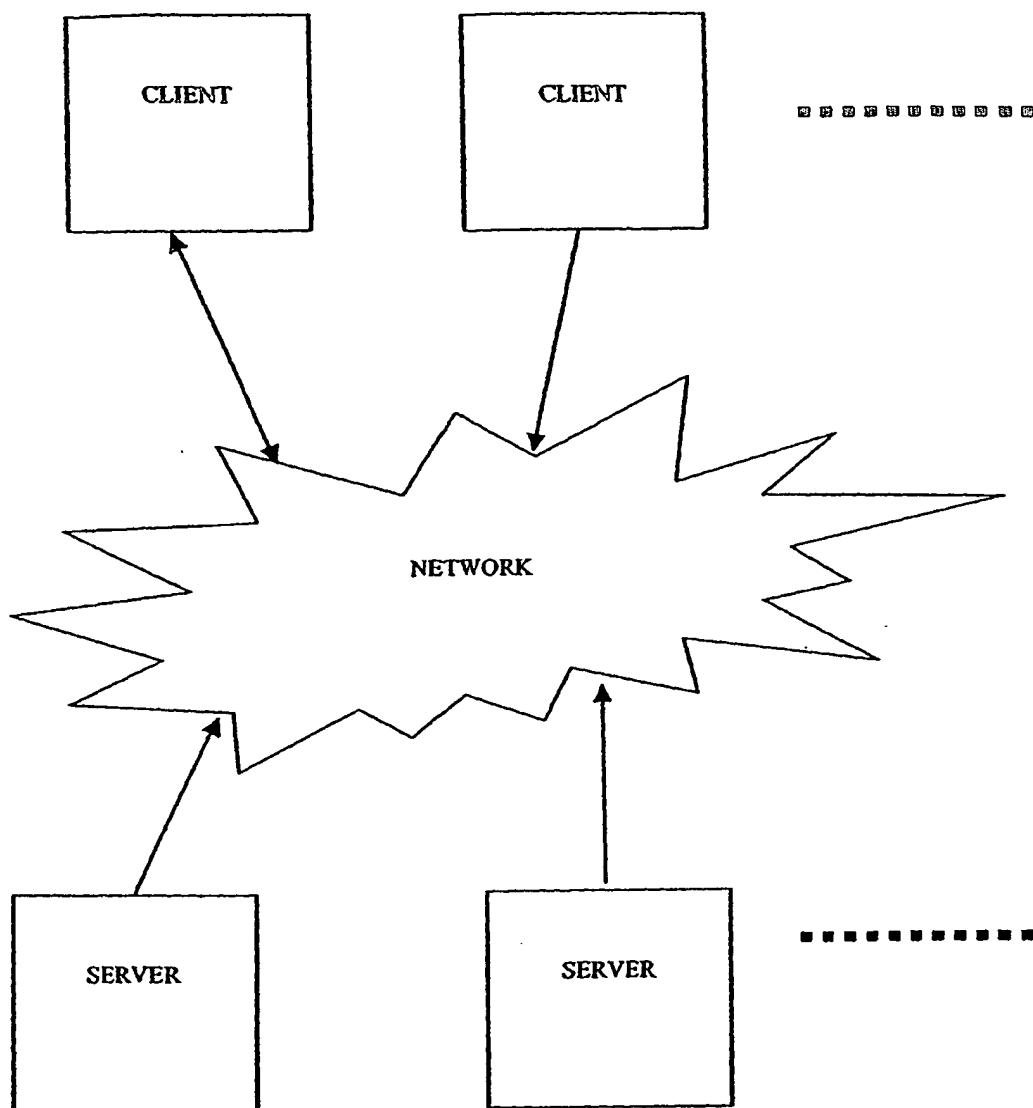


Fig. 1B

## QD Data Structure

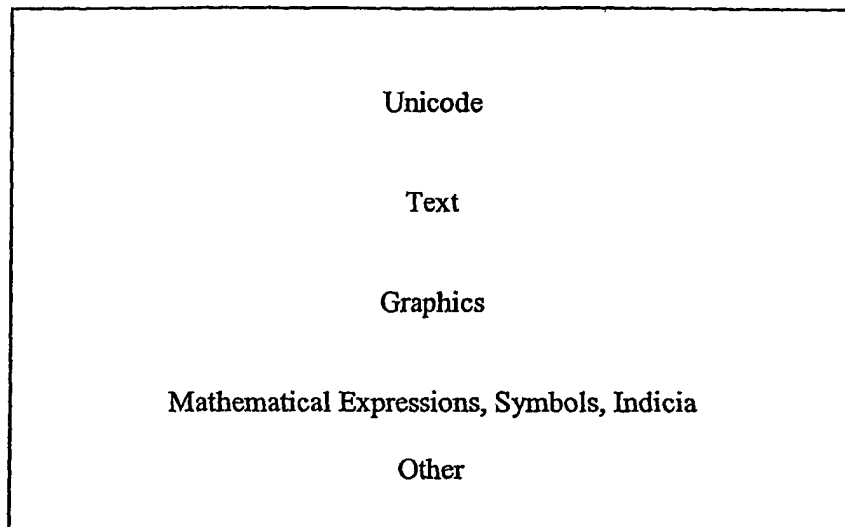


FIG. 2

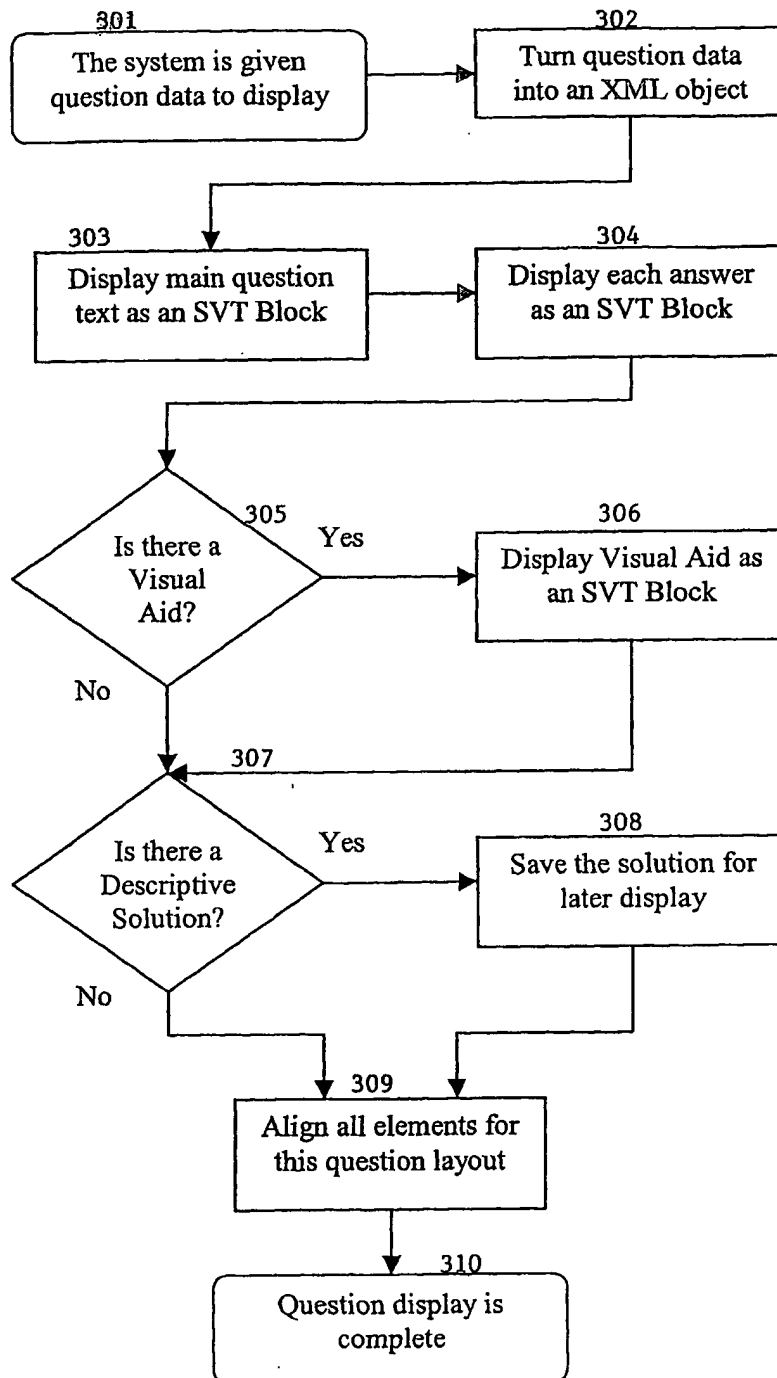
**Question Display Flowchart**

Fig. 3

**Question Display Pseudo-code**

```
function parseQuestionXML
    convert raw text to an XML tree
    get question layout style from XML
end parseQuestionXML function

function buildQuestionObjects
    // Sort through branches of question XML.
    for each branch
        if the branch is the main question text
            create a movieclip to contain the text
            call the displaySVTBlock function
        else if the branch is the answer options
            create a movieclip to hold the answers
            for each answer
                create a movieclip to hold the answer
                attach an answer button
                create a movieclip to hold the answer text
                call the displaySVTBlock function
            end for
        else if the branch is some other content block
            if the type of content is visual aid
                if this layout calls for a visual aid
                    create a movieclip to contain the visual aid
                    call the displaySVTBlock function
                else if the type of content is descriptive solution
                    save the contents for possible later display
                end if
            end if
        end for
    end buildQuestionObjects function

function layoutQuestion
    // Positions are based on the question layout style.
    position the main question text
    position the answer block
    position the answers within the answer block
    position the visual aid, if required
    position any other content block
end layoutQuestion function
```

Fig. 4

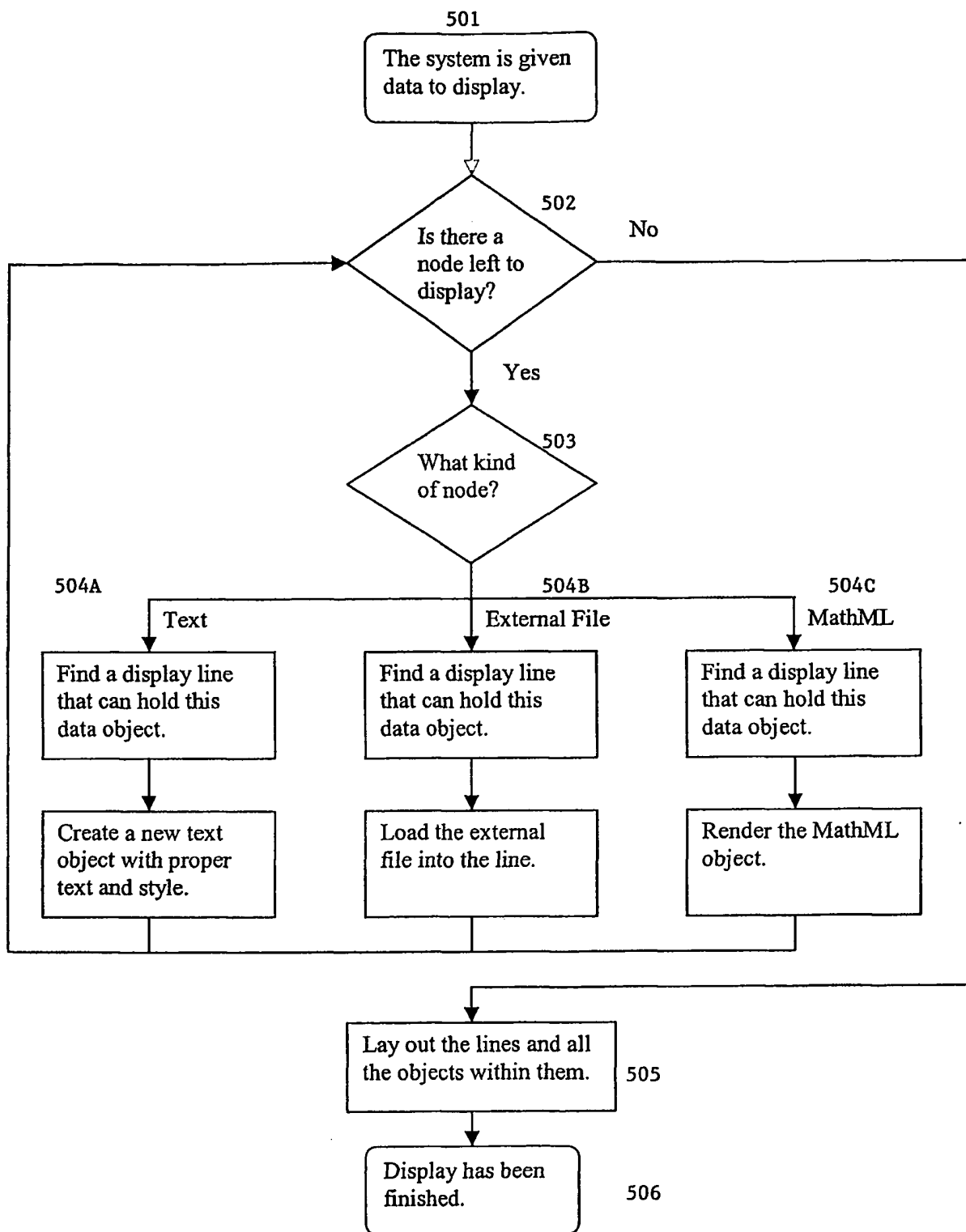
**SVT Display Flowchart**

Fig. 5

## SVT Display Pseudo-code

```

// The displayContentBlock function is the interface to other
// code.
// External code would call this function, specifying the xml
// data to
// display, the destination to display into, and any non-default
// configuration options.

function displaySVTBlock
    // initialize the environment of the destination,
    based on // configuration options.
    // set the environment's width
    // set a default text style

    for each node in the XML data
        if node is text
            call the displayText function
        reference else if node is a visual aid file
            call the loadFile function
        else if node is MathML
            call the displayMath function
        end if
    end for

    for each line that has been created in destination
        for each object in line
            gather measurements
        end for
        compute shared baseline and boundaries of
    line for each object in line
        position the object so
    baselines are aligned end for
        align line to other lines and destination
    end for
end displaySVTBlock

function displayText
    inherit the default text style
    modify the style as specified for this node
    create an object to hold text within the current line

    while there is text in the node
        remove a word of text
        add the word to the current line of
    destination if current line has exceeded length
        remove the last line
        mark the line done
        create a new current line
        create an object to hold text
    within the current line add the word to the current
    line
    end while end if
end renderText

function loadFile
    extract file information from node
    create an object of the file's given dimensions
    begin loading the file

    if the object fits in the current line of destination
        place the object into the line
    else
        create a new line
        if the object doesn't fit into the new
    empty line scale the object to fit the
    line
    end if
    place the object into the line
    end if
end loadFile

function displayMath
    create an object to render the math node into
    extract MathML data from node
    call the renderMath function

    if the object fits in the current line of destination
        place the object into the line
    else
        create a new line
        if the object doesn't fit into the new
    empty line scale the object to fit the
    line
    end if
    place the object into the line
    end if
end displayMath

// This function is called recursively -- that is, it calls
// itself.
// MathML objects are frequently composed of other MathML
// objects.
// such as fractions of fractions, so this recursion is
// necessary.
// Nodes in the MathML are of two major types: composite or
// terminal.
// Composite nodes contain other nodes, while terminal nodes
// contain
// only values, such as a number, variable, or mathematical
// symbol.
// For instance, a fraction node would have two child nodes, the
// numerator and denominator. Each child is rendered separately,
// then
// the first is placed over the other, and a line is drawn
// between
// them.

function renderMath
    if the current node is a composite node
        call the renderMath function on each
    child node
    else if the current node is a terminal node
        if the node contains text
            create a text box of the
        appropriate style
        else if the node contains an encoded
        symbol
            insert the graphic for that
        symbol
        end if
    end if
end renderMath

```

Fig. 6

2 4 6 8 10

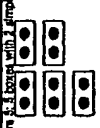

Item	Planet II Instruction Codes	Planet II Sample Question Text	Multiple Choice Answers					Answer	What's the Answer?
			a	b	c	d	e		
70	02N02C	80 354 = ____ tens and 4 ones	8	35	354	58	50	b	WHAT DO WE KNOW? Tico and 60 people in the park, males AND females. 37 of them are boys. HOW DO WE GET THE ANSWER? Tico (80 - 31) = 49 females. WHAT'S THE ANSWER? Tico are 49 females.
71	02N02C	95 There were 85 people in the park. 37 of them were male. How many of them were female?	52 females	42 females	48 females	58 females	122 females	c	WHAT DO WE KNOW? Mrs. Kim sold 25 eggs this morning. She sold another 50 eggs in the afternoon. She still has 18 eggs left. How many eggs did she have to begin with? HOW DO WE GET THE ANSWER? 75 eggs (25 + 50). But one will have 18 eggs left, she must have had (75 + 18) eggs to start the day. WHAT'S THE ANSWER? She began the day with 93 eggs.
72	02N02C	95 Mrs. Kim sold 25 eggs this morning. She sold another 50 eggs in the afternoon. She still has 18 eggs left. How many eggs did she have to begin with?	63 eggs	76 eggs	26 eggs	68 eggs	7 eggs	a	See Figure 4: A group of 25 eggs (top) and a group of 50 eggs (bottom) with a "+" sign between the two groups of eggs. "Mrs. Kim" with 18 eggs.
73	02N02C	96 $854 + 354 = \underline{\hspace{2cm}}$	1,208	1,108	1,158	500	208	a	
74	02N02C	100 5 twos = ____	5 + 5	2 + 2	$2 + 2 + 2 + 2 + 2$	55	22	c	See Figure 5: 5 boxes with 2 simple shapes in each box ("5 twos") 
75	02N02C	100 4 threes = ____	4	8	12	6	9	c	See Figure 6: 4 boxes with 3 simple shapes in each box ("4 threes") 
76	02N02C	100 Grace is 30 years younger than her father. Her brother is 1 year older than Grace. Grace's father is 57 years old. How old is Grace's brother?	80 years old	27 years old	20 years old	26 years old	28 years old	e	WHAT DO WE KNOW? Grace's father is 57 years old. Grace is 30 years younger than her father (57 - 30). Her brother is 1 year older than she. HOW DO WE GET THE ANSWER? Grace is (87 - 30) years old. She is 27 years old. Grace's brother is (27 + 1) years old. WHAT'S THE ANSWER? Grace's brother is 28 years old.

FIG. 7



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/10027

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : G06F 15/00, 17/30

US CL : 715/513; 707/102

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 715/513; 707/102

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Please See Continuation Sheet

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6,463,440 B1 (HIND et al) 08 October 2002 (08.10.2002), whole document.	1-16
A	CARLISLE. D. OpenMath, MathML, and XSL ACM SIGSAM bull. June 2000, Vol. 34. Issue 2, pages 6-11.	1-16

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

* Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

19 August 2004 (19.08.2004)

Date of mailing of the international search report

09 SEP 2004

Name and mailing address of the ISA/US

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Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Facsimile No. (703) 305-3230

Authorized officer

Joseph Feild

Telephone No. (703) 305-3900

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US04/10027

Continuation of B. FIELDS SEARCHED Item 3:

ACM

search terms: MathML, document parsing, trees

## **Exhibit C-2**

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City ROSELAND State NJ ZIP 07068-1031

2 Your Internal Billing Reference 102907-419712

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# GOODWIN PROCTER

Patrice A. King  
973-994-7896  
pking@goodwinprocter.com

Goodwin Procter LLP  
Counsellors at Law  
103 Eisenhower Parkway  
Roseland, NJ 07068  
T: 973-992-1990  
F: 973-992-4643

April 13, 2005

## Via E-Mail and Federal Express

Joe Fusion  
214 NE 29<sup>th</sup> Avenue  
Portland, OR 97232

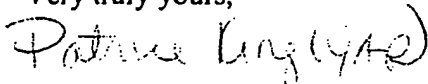
Re: U.S. Patent Application for ADVANCED VERSATILE LAYOUT AND  
RENDERING SYSTEM  
Application No.: US 04/10027

Dear Joe:

Pursuant to your conversation with Lewis, enclosed please find for your review and execution a "Declaration of Inventorship" and a "Patent Assignment" for the above identified patent case. Under the United States patent laws, each inventor must sign a statutory oath or declaration of inventorship attesting that they are the first and original inventors of the claimed inventions. The patent assignment will effectuate the transfer of your rights in the inventions to Planetii as set forth in your employment letter agreement with Planetii. For your convenience, I have also enclosed a copy of the published application for your review.

Please return a copy of the executed documents to our offices by e-mail or facsimile, and the original document by mail. If you have any questions, please do not hesitate to contact me.

Very truly yours,



Patrice A. King, Esq.  
PZK:yap  
Enclosure

## **Exhibit C-3**

FILE

King, Patrice A

---

From: King, Patrice A  
Sent: Tuesday, May 17, 2005 6:16 PM  
To: 'jfusion@monkey.org'  
Cc: Barberi, Katherine  
Subject: REMINDER - Planetii - US Patent Application

REMINDER!

-----Original Message-----

From: King, Patrice A  
Sent: Tuesday, April 12, 2005 6:04 PM  
To: 'jfusion@monkey.org'  
Cc: 'Lewis Cheng'  
Subject: Planetii - US Patent Application



WO2004090739A1.4405042\_1.doc (92  
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KB)



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US Patent Application for ADVANCED VERSATILE LAYOUT AND RENDERING SYSTEM  
Appl. No.: US04/10027

Dear Joe:

Pursuant to your conversation with Lewis, attached please find for your review and execution a "Declaration of Inventorship" and a "Patent Assignment" for the above identified patent case. Under the United States patent laws, each inventor must sign a statutory oath or declaration of inventorship attesting that they are the first and original inventors of the claimed inventions. The patent assignment will effectuate the transfer of your rights in the invention to Planetii as set forth in your employment letter agreement with Planetii. For your convenience, I have also attached a copy of the published application for your review.

Please return a copy of the executed documents to our offices by e-mail or facsimile, and the original document by mail. If you have any questions, please do not hesitate to contact me.

Kindly acknowledge receipt of this e-mail.

Regards,

Patrice

Patrice Andrea King, Esq.  
Associate Attorney  
Goodwin Procter LLP  
103 Eisenhower Parkway  
Roseland, New Jersey 07068  
Direct Dial: 973.994.7896

General: 973.992.1990

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E-mail: [pking@goodwinprocter.com](mailto:pking@goodwinprocter.com)

URL: [www.goodwinprocter.com](http://www.goodwinprocter.com)



## **Exhibit C-4**

**Barberi, Katherine**

---

**From:** King, Patrice A  
**Sent:** Monday, September 19, 2005 8:24 AM  
**To:** 'jfusion@monkey.org'  
**Cc:** Barberi, Katherine  
**Subject:** FW: Planetii - US Patent Application - URGENT REMINDER

URGENT REMINDER - DUE OCTOBER 1, 2005

Please see below. Thank you.

-----Original Message-----

**From:** King, Patrice A  
**Sent:** Tuesday, April 12, 2005 6:04 PM  
**To:** 'jfusion@monkey.org'  
**Cc:** 'Lewis Cheng'  
**Subject:** Planetii - US Patent Application



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US Patent Application for ADVANCED VERSATILE LAYOUT AND RENDERING SYSTEM  
Appl. No.: US04/10027

Dear Joe:

Pursuant to your conversation with Lewis, attached please find for your review and execution a "Declaration of Inventorship" and a "Patent Assignment" for the above identified patent case. Under the United States patent laws, each inventor must sign a statutory oath or declaration of inventorship attesting that they are the first and original inventors of the claimed inventions. The patent assignment will effectuate the transfer of your rights in the invention to Planetii as set forth in your employment letter agreement with Planetii. For your convenience, I have also attached a copy of the published application for your review.

Please return a copy of the executed documents to our offices by e-mail or facsimile, and the original document by mail. If you have any questions, please do not hesitate to contact me.

Kindly acknowledge receipt of this e-mail.

Regards,

Patrice

Patrice Andrea King, Esq.  
Associate Attorney  
Goodwin Procter LLP  
103 Eisenhower Parkway  
Roseland, New Jersey 07068

Direct Dial: 973.994.7896

General: 973.992.1990

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E-mail: [pking@goodwinprocter.com](mailto:pking@goodwinprocter.com)

URL: [www.goodwinprocter.com](http://www.goodwinprocter.com)

## **Exhibit C-5**



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Thu, Sep 15

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## **Exhibit D**

## ASSIGNMENT OF RIGHTS: PATENT APPLICATION

WHEREAS, WE, Lewis Cheng, a citizen of Canada, and Joseph Fusion and Kyung Lee, each citizens of the United States, as ASSIGNORS, residing respectively at: 2400 W. El Camino Real, #715, Mountain View, CA 94040; 214 NE 29th Ave., Portland, OR 97232; and 1275 15th St. #6R, Fort Lee, NJ 07024; are the inventors of the invention entitled, **Advanced Versatile Layout and Rendering System**, for which an application for a United States Patent was filed on April 1, 2003, Serial no. 60/459329, and for which a PCT application was filed on April 1, 2004, Serial No. PCT/US04/10027 and;

WHEREAS, Planetii USA, Inc., doing business at 2400 W. El Camino Real #715, Mountain View, CA 94040, ASSIGNEE is desirous of obtaining the entire right, title and interest in, to and under the said invention and the said application:

NOW, THEREFORE, in consideration of the sum of One Dollar (\$1.00) to us in hand paid, and other good and valuable consideration, the receipt of which is hereby acknowledged, we, the said ASSIGNORS, have sold, assigned, transferred and set over, and by these presents do hereby sell, assign, transfer and set over, unto the said ASSIGNEE, its successors, legal representatives and assigns, the entire right, title and interest in, to and under the said invention, and the said United States application and all divisions, renewals and continuations thereof, and all Patents of the United States which may be granted thereon and all reissues and extensions thereof; and all applications for industrial property protection, including, without limitation, all applications for patents, utility models, and designs which may hereafter be filed for said invention in any country or countries foreign to the United States, together with the right to file such applications and the right to claim for the same the priority rights derived from said United States application under the Patent Laws of the United States, the International Convention for the Protection of Industrial Property, or any other international agreement or the domestic laws of the country in which any such application is filed, as may be applicable; and all forms of industrial property protection, including, without limitation, patents, utility models, inventors' certificates and designs which may be granted for said invention in any country or countries foreign to the United States and all extensions, renewals and reissues thereof;

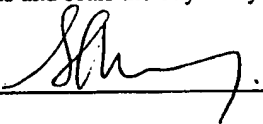
AND WE HEREBY authorize and request the Commissioner of Patents and Trademarks of the United States, and any Official of any country or countries foreign to the United States, whose duty it is to issue patents or other evidence or forms of industrial property protection on applications as aforesaid, to issue the same to the said ASSIGNEE, its successors, legal representatives and assigns, in accordance with the terms of this instrument.

AND WE HEREBY covenant and agree that we have full right to convey the entire interest herein assigned, and that we have not executed, or will not execute, any agreement in conflict herewith.

AND WE HEREBY further covenant and agree that we will communicate to the said ASSIGNEE, its successors, legal representatives and assigns, any facts known to us respecting said invention, and testify in any legal proceeding, sign all lawful papers, execute all divisional, continuing, reissue and foreign applications, make all rightful oaths, and generally do everything possible to aid the said ASSIGNEE, its successors, legal representatives and assigns, to obtain and enforce proper protection for said invention in all countries.

IN TESTIMONY WHEREOF, We hereunto set our hands and seals the day and year set opposite our respective signatures.

Date: 4/28/05

  
\_\_\_\_\_  
Lewis Cheng

Date: \_\_\_\_\_

\_\_\_\_\_  
Joseph Fusion

Date: \_\_\_\_\_

\_\_\_\_\_  
Kyung Lee



## ASSIGNMENT OF RIGHTS: PATENT APPLICATION

WHEREAS, WE, Lewis Cheng, a citizen of Canada, and Joseph Fusion and Kyung Lee, each citizens of the United States, as ASSIGNORS, residing respectively at

2400 W. El Camino Real, #715, Mountain View, CA 94040,

1322 The Alameda #358, San Jose, CA 95126,

are the inventors of the invention entitled, **Advanced Versatile Layout and Rendering System**, for which an application for a United States Patent was filed on April 1, 2003, Serial no. 60/459329, and for which a PCT application was filed on April 1, 2004, Serial no. PCT/US04/10027 and,

WHEREAS, Planetii USA, Inc., doing business at 560 S. Winchester Blvd., Suite 305, San Jose, California 95128, ASSIGNEE is desirous of obtaining the entire right, title and interest in, to and under the said invention and the said application:

NOW, THEREFORE, in consideration of the sum of One Dollar (\$1.00) to us in hand paid, and other good and valuable consideration, the receipt of which is hereby acknowledged, we, the said ASSIGNORS, have sold, assigned, transferred and set over, and by these presents do hereby sell, assign, transfer and set over, unto the said ASSIGNEE, its successors, legal representatives and assigns, the entire right, title and interest in, to and under the said invention, and the said United States application and all divisions, renewals and continuations thereof, and all Patents of the United States which may be granted thereon and all reissues and extensions thereof; and all applications for industrial property protection, including, without limitation, all applications for patents, utility models, and designs which may hereafter be filed for said invention in any country or countries foreign to the United States, together with the right to file such applications and the right to claim for the same the priority rights derived from said United States application under the Patent Laws of the United States, the International Convention for the Protection of Industrial Property, or any other international agreement or the domestic laws of the country in which any such application is filed, as may be applicable; and all forms of industrial property protection, including, without limitation, patents, utility models, inventors' certificates and designs which may be granted for said invention in any country or countries foreign to the United States and all extensions, renewals and reissues thereof;

AND WE HEREBY authorize and request the Commissioner of Patents and Trademarks of the United States, and any Official of any country or countries foreign to the United States, whose duty it is to issue patents or other evidence or forms of industrial property protection on applications as aforesaid, to issue the same to the said ASSIGNEE, its successors, legal representatives and assigns, in accordance with the terms of this instrument.

AND WE HEREBY covenant and agree that we have full right to convey the entire interest herein assigned, and that we have not executed, or will not execute, any agreement in conflict herewith.

AND WE HEREBY further covenant and agree that we will communicate to the said ASSIGNEE, its successors, legal representatives and assigns, any facts known to us respecting said invention, and testify in any legal proceeding, sign all lawful papers, execute all divisional, continuing, reissue and foreign applications, make all rightful oaths, and generally do everything possible to aid the said ASSIGNEE, its successors, legal representatives and assigns, to obtain and enforce proper protection for said invention in all countries.

IN TESTIMONY WHEREOF, We hereunto set our hands and seals the day and year set opposite our respective signatures.

Date:

Lewis Cheng

On this \_\_\_\_\_ day of \_\_\_\_\_, before me personally appeared the Assignor \_\_\_\_\_, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument, and acknowledged to me that she executed the same.

WITNESS my hand and official seal in \_\_\_\_\_ County of \_\_\_\_\_ on the date set forth in this certificate.

\_\_\_\_\_  
Notary Public

Date:

Joseph Fusion

On this \_\_\_\_\_ day of \_\_\_\_\_, before me personally appeared the Assignor - \_\_\_\_\_, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument, and acknowledged to me that he executed the same.

WITNESS my hand and official seal in \_\_\_\_\_ County of \_\_\_\_\_ on the date set forth in this certificate.

\_\_\_\_\_  
Notary Public

Date: 11/11/2004

Kyung Lee

On this 11 day of November, before me personally appeared the Assignor - Kyung Lee, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument, and acknowledged to me that he executed the same.

WITNESS my hand and official seal in Santa Clara County of California on the date set forth in this certificate.

[Signature]  
Notary Public





September 7, 2001

Joe Fusion  
655 5th Avenue  
Brooklyn, New York

Dear Joe:

We are pleased to offer you a position at PLANETii USA Inc. ("PLANETii") as Multimedia Developer beginning on September 10, 2001, under the terms and conditions set forth below. You will report directly to Shun C. Chu. As Multimedia Developer, you will be compensated at a rate of US\$3,750 monthly (US\$45,000 pro-rated annually) in accordance with PLANETii's standard payroll practices. All amounts payable to you shall be reduced by standard withholdings and other authorized deductions.

Upon PLANETii's next round of official funding, your rate of compensation will increase up to US\$4,584 monthly (US\$55,000 pro-rated annually) in accordance with PLANETii's standard payroll practices. The exact amount of increase will be decided by the management of PLANETii and will depend on your overall performance.

Your first performance review will be on December 10, 2001. PLANETii may issue you a formal grant of stock options on December 10, 2001, pursuant to the terms of the plan and applicable standard agreement developed by PLANETii. The terms of stock options granted to you will also be decided by the management of PLANETii and will also depend on your overall performance.

You are also eligible for PLANETii's health and dental insurance coverage after the 3<sup>rd</sup> month of employment. If you choose to enroll, PLANETii pays 50% of the associated costs of your health and dental plan. Please do not hesitate to ask us for more details about our particular plan details.

As an employee of PLANETii, you understand that, in its business, PLANETii has developed and will use commercially valuable technical and non-technical information that is vital to the success of PLANETii's business. You understand that it is necessary for PLANETii to protect such information as confidential and proprietary ("Confidential and Proprietary Information"). Such Confidential and Proprietary Information shall include: (a) research and development work; source code; object code; run-time libraries; system documentation; software-related documentation; system configurations; hardware design; firmware design; layout; and operation of PLANETii's facilities and equipment; all of these items for both customers/clients and for PLANETii's internal operations; (b) contents of proposals/contracts with all former, existing, and prospective customers/clients; costing and estimation procedures and formulae regarding proposals and other uses; sales, profit and loss, profit margin, production costs, overhead, and other bookkeeping and accounting information; all information regarding business development and marketing; names of vendors and suppliers not well known to the trade; all contacts at all such vendors and suppliers whether or not such vendors and suppliers are well known to the trade; costs and contents of proposals and contracts with such vendors and supplies; and (c) confidential information revealed to PLANETii by third parties and which PLANETii is obligated to keep confidential; all copies of this agreement, and any other information that may be considered by PLANETii as PLANETii's confidential information under applicable laws. Confidential and Proprietary Information shall not include information which is, or becomes, in the public domain, unless this occurs through a breach of any of the obligations hereunder; information in your possession from a third party source that is not in breach of any obligation owed to PLANETii; or information required to be disclosed by law.

You agree to hold in confidence all Confidential and Proprietary Information disclosed to you or developed by you in connection with your employment by PLANETii, either in writing, verbally, or as a result of your employment. You shall not, without permission of PLANETii, use or duplicate Confidential and Proprietary Information that you are obligated hereunder to maintain in confidence for any reason other than to enable you to properly and completely perform your job. You shall immediately notify PLANETii of any information that comes to your attention that does or might indicate that there has been any loss of confidentiality of such Confidential and Proprietary Information. Upon termination of employment for any



reason whatsoever, or upon PLANETii's request, you shall promptly return all correspondence, drawings, blue prints, manuals, letters, notes, notebooks, reports, flowcharts, programs, proposals, documents concerning PLANETii's customers/clients and vendors/suppliers, documents concerning products or processes used by PLANETii, and all other documents, writing, and materials utilized by you, together with any copies or other reproductions made in any medium thereof made by you or in your possession or control. You understand that all such records, whether developed by you or others, are and shall remain the property of PLANETii.

Additionally, all files, input and output materials, the media upon which they are located (including cards, tapes, discs and other storage facilities), software programs or packages (together with any related documentation, and any related materials), database information and other materials which are designed, written or developed in the course of your employment, or any such materials designed, written or developed for or delivered to PLANETii, or designed, written or developed with the use of PLANETii property or personnel, and which may or may not be either confidential or proprietary (collectively, the "PLANETii Materials") shall, as between you and PLANETii, be the sole and exclusive property of PLANETii.

You agree that PLANETii Materials shall be a "work made for hire" (as defined in the Copyright Act of 1976), and that PLANETii shall be considered the author of PLANETii Materials for all purposes and the owner of all the rights comprised in the undivided copyright (and all renewals and extensions thereof) in and to PLANETii Materials and of any and all other rights in PLANETii Materials including patents, trade secret rights, trademarks and other proprietary rights.

In the event that PLANETii Materials are determined not to be a work made for hire and/or there are any rights which do not accrue to PLANETii under this Section, the Agreement shall operate as an irrevocable grant, transfer, sale and assignment to PLANETii of all right, title and interest, including all undivided copyrights (and renewals and extensions thereof) patents, trade secret rights, trademarks and other proprietary rights, in and to PLANETii Materials throughout the universe in all languages and in all media and forms of expressions and communication now known or later developed. The foregoing shall be effective as to each item created by you under this Agreement as of the moment such item is fixed in a tangible medium whether or not such item is complete. Accordingly, PLANETii shall own all works in progress. You shall have no rights of any kind in PLANETii Materials. No rights are reserved to you. You shall execute any and all documents required to effectuate this assignment as PLANETii may reasonably request from time to time.

Further, you shall not, during your employment and for a period of one year following the separation of your employment for any reason, directly or indirectly, influence, solicit or canvass, or attempt to influence, solicit or canvass (a) any customer/vendor of PLANETii to divert their business to any person or entity then in competition with PLANETii (ie., web mathematics tutorial products/services), or otherwise attempt induce any customers to terminate their relationship with PLANETii, or (b) any employee of PLANETii to work for any individual or entity then in competition with the business of PLANETii, or otherwise to terminate his or her relationship with PLANETii.

You recognize and agree that your employment relationship with PLANETii will be "at-will" for all purposes, which means that either you or PLANETii may terminate your employment at any time for any reason. You recognize and agree that this offer of employment is not intended to be and should not be construed to be a contract of employment for any specified duration. Further, PLANETii reserves the right at any time to transfer or second your employment to other companies within PLANETii's group of companies to perform any other reasonable duties (either in addition to or in substitution for your then existing duties). You agree to devote your working time to PLANETii and not engage in other employment unless granted by prior written permission by your manager.

You understand that you have no authority either express or implied, to act or represent that you are acting on behalf of PLANETii, except in those instances in which PLANETii has given you prior written consent that specifically covers your acts or representations. You may not receive any income or material gain from any individuals or entities outside PLANETii for materials produced or service rendered while employed by PLANETii without the prior consent of the President or the Chief Executive Officer of PLANETii.

**planetii**

By accepting this offer, you affirm that you have the full right and authority to accept this offer and to perform any services required of you in your position as Multimedia Developer, and that by accepting this offer and performing such services you are not breaching any contract or legal obligation you owe to any third party. You acknowledge and understand that your employment is contingent upon verification of your identity and your ability to work for PLANETii and receive compensation for such work.

You acknowledge that PLANETii will be irreparably harmed if your obligations hereunder are not specifically enforced and that PLANETii would not have an adequate remedy at law in the event of an actual or threatened violation by you of your obligations hereunder. Therefore, you agree and consent that PLANETii shall be entitled to an injunction or any appropriate decree of specific performance of any actual or threatened violation or breaches by you or your agent, without the posting of any bond, and such other relief as may be just and proper, including the right to recover all losses or damages suffered by PLANETii resulting from any such breach of threatened breach. You further agree that, in such event, you shall reimburse PLANETii for its attorneys' fees and costs. In the event PLANETii applies to seal any papers produced or files in any judicial proceedings to preserve confidentiality, then you specifically agree not to oppose such application. You consent to the exclusive jurisdiction of the federal and state sitting in the State of New York for all such purposes, and waive any claims you may have that jurisdiction is not proper or such venue is not convenient. The parties hereto further consent that any summons and complaint or notice may be served by certified mail, return receipt requested at the address set forth above.

This offer supersedes and replaces any and all prior offers, agreements, statements, and representations made, whether written or oral, including statements and representations made in any advertisement or in the course of any job interviews, discussions, or negotiations for this position. This offer cannot be amended or otherwise modified and no breach or term of this offer letter may be waived except by a writing signed by a duly authorized officer of PLANETii. This agreement shall be construed and enforced according to the laws of the State of New York applying to contracts that are wholly performed within New York, without regard to principles of conflicts of law.

Joe, we look forward to having you become a member of the PLANETii team and hope you will find this position to be a rewarding career opportunity. With your background and experience, we think you will be an excellent fit for this position as well as a great asset to our company. If you require any additional information, please call me at (718) 625-8542.

Sincerely,



Shun C. Chu  
Chief Technology Officer

Please sign and return one copy of this letter to indicate your acceptance of the terms of this offer letter and retain one copy for your records

Offer Accepted:

Joe Fusion

Date

9.10.2001